

**TEACHING VOCABULARY THROUGH DUOLINGO APPLICATION
AT THE SECOND GRADE OF MTsN 2 BANDAR LAMPUNG**

(Undergraduate Thesis)

Adinda Aurethashafa Priandana

2013042057



**ENGLISH EDUCATION STUDY PROGRAM
DEPARTMENT OF LANGUAGE AND ARTS EDUCATION
FACULTY OF TEACHER TRAINING AND EDUCATION
UNIVERSITY OF LAMPUNG
BANDAR LAMPUNG**

2024

ABSTRACT

TEACHING VOCABULARY THROUGH DUOLINGO AT THE SECOND GRADE OF MTsN 2 BANDAR LAMPUNG

By

Adinda Aurethashafa Priandana

Vocabulary, along with sentence structure and punctuation, is an essential part of language. However, students sometimes have difficulty remembering vocabulary. The study aims to determine if students' vocabulary improves after they are taught using Duolingo.

This study adopts a descriptive quantitative technique. It was conducted in MTsN 2 Bandar Lampung. The subject of this research is second-year students in class VIII-A. The researcher administered a vocabulary test to the students, which included 25 questions regarding words commonly used in everyday life, particularly about previous activities. After administering the vocabulary pre-test, the researcher used Duolingo as a tool for vocabulary acquisition. The researcher then administered a post-test to assess students' vocabulary following treatment.

Following the treatment, students' language skills improved significantly, as seen by their post-test scores. The students' scores improved from 66.11 on the pre-test to 78.89 on the post-test. This statement is supported by the result of the t-table ($7.831 > 2.031$). Duolingo boosts students' understanding and memory retention, which is why the meaning aspect improves the most after the students are taught through Duolingo. It can be concluded that Duolingo is considered an effective media for increasing students' vocabulary knowledge.

Keywords: *Duolingo, Teaching Vocabulary, Language Learning, Vocabulary Knowledge, Vocabulary*

**TEACHING VOCABULARY THROUGH DUOLINGO APPLICATION
AT THE SECOND GRADE OF MTsN 2 BANDAR LAMPUNG**

By

Adinda Aurethashafa Priandana

Undergraduate Thesis

Submitted in a Partial Fulfillment of

The Requirements for S-1 Degree

In

The Language and Arts Education Department

Faculty of Teacher Training and Education



ENGLISH EDUCATION STUDY PROGRAM

DEPARTMENT OF LANGUAGE AND ARTS EDUCATION

FACULTY OF TEACHER TRAINING AND EDUCATION

UNIVERSITY OF LAMPUNG

2024

**Research Title : TEACHING VOCABULARY THROUGH
DUOLINGO APPLICATION AT THE SECOND
GRADE OF MTSN 2 BANDAR LAMPUNG**

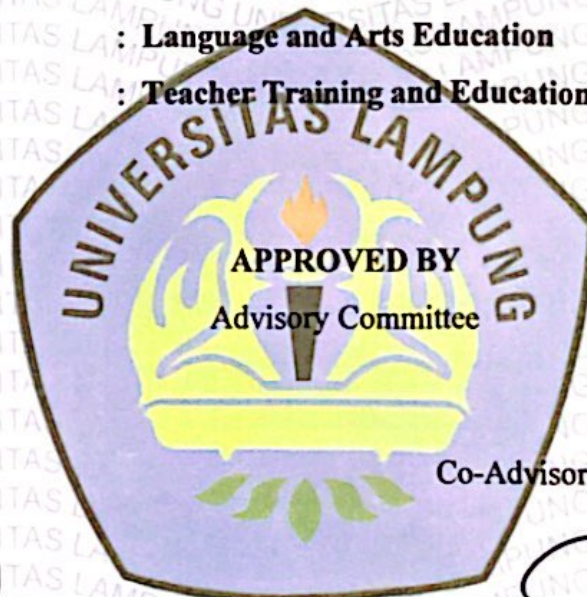
Student's Name : Adinda Aurethashafa Priandana

Student's Number : 2013042057

Study Program : English Education

Department : Language and Arts Education

Faculty : Teacher Training and Education



Advisor

Dr. Ari Nurweni, M.A.
NIP 19630302 198703 2 001

Co-Advisor

Dian Shafwati, S.Pd., M.Pd.
NIP 19890913 201903 2 012

**The Chairperson of
The Department of Language and Arts Education**

Dr. Sumarti, M.Hum.
NIP. 19700318 199403 2 002

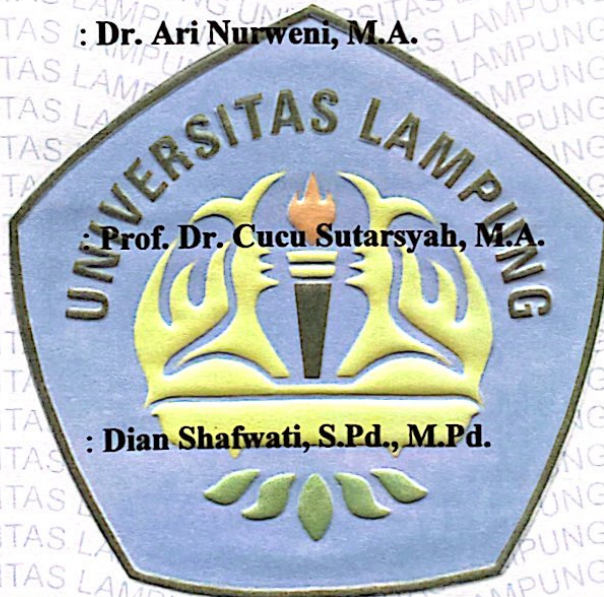
ADMITTED BY

1. Examination Committee

Chairperson : Dr. Ari Nurweni, M.A.

Examiner : Prof. Dr. Cucu Sutarsyah, M.A.

Secretary : Dian Shafwati, S.Pd., M.Pd.



[Handwritten signature]
.....
[Handwritten signature]
.....
[Handwritten signature]
.....

2. The Dean of Teacher Training and Education Faculty



Prof. Dr. Sunyono, M.Si.
NIP19651230 199111 1 001

Graduated on: May 28th, 2024

LEMBAR PERNYATAAN

Yang bertanda tangan di bawah ini, saya:

Nama : Adinda Aurethashafa Priandana

NPM : 2013042057

Program Studi : Pendidikan Bahasa Inggris

Jurusan : Pendidikan Bahasa dan Seni

Fakultas : Keguruan dan Ilmu Pendidikan

Judul Skripsi : Teaching Vocabulary through Duolingo Application at the
Second Grade of MTsN 2 Bandar Lampung

Menyatakan bahwa skripsi ini adalah benar hasil karya saya sendiri. Sepanjang pengetahuan saya, karya ini tidak berisi materi yang ditulis oleh orang lain, kecuali bagian-bagian tertentu yang saya ambil sebagai acuan. Apabila ternyata terbukti bahwa pernyataan ini tidak benar, sepenuhnya menjadi tanggung jawab saya.

Bandar Lampung, 28 Mei 2024

Yang membuat pernyataan,



Adinda Aurethashafa P.

2013042057

CURRICULUM VITAE

The writer's name is Adinda Aurethashafa Priandana. She was born on July 13th, 2001, in Bandung Baru. She is the first child of two. Her father's name is Suprianto, and her mother's name is Endah Ari Wahyuni. She has a sister named Ranaya Chalisthalia Priandana.

She started her first formal education in elementary school at SD Al-Azhar 1 in 2006 and graduated in 2013. She continued her studies at MTsN 2 Bandar Lampung and graduated in 2016. Then, she continued her studies at SMAN 5 Bandar Lampung from 2016 to 2019. In 2020, she enrolled in the English Education Study Program at Faculty Teacher Training and Education at Lampung University.

During her studies, she was also active inside and outside the campus. In 2022, she was the former Head of the Media Center of SEEDS. In 2023, she joined Kampus Mengajar 5 from February to June.

DEDICATION

This script is dedicated to:

My beloved parents

My beloved sister

My beloved family

English Education Study Program classmates

My almamater, Lampung University

MOTTO

You cannot change the wind, but you can adjust the sails.

(Elizabeth Edwards)

ACKNOWLEDGMENTS

All praises be to Allah SWT, The Almighty God, for the gracious mercy and blessing that enable the writer to finish her script. Peace and salutation be upon our prophet Muhammad SAW, who has brought human beings from the darkness into the lightness. This script entitled “Teaching Vocabulary through Duolingo Application at the Second Grade of MTsN 2 Bandar Lampung” is submitted as a compulsory fulfillment of the requirement for S-1 Degree at the Language and Arts Education Study Program, Language and Arts Education Department of Teacher Training and Education Faculty of University of Lampung.

This script would never have existed without support, encouragement, and assistance from several gorgeous persons and institutions. Thus, the writer wants to express her respect and gratitude to:

1. Dr. Ari Nurweni, M.A., as the first advisor for her ideas, criticisms, motivations, and encouragement in supporting the writer’s research.
2. Dian Shafwati, S.Pd., M.Pd., as the second advisor for her ideas, criticisms, motivations, and guidance in correcting and supporting the writer’s research.
3. Prof. Dr. Cucu Sutarsyah, M.A., as the examiner, for his encouragement, ideas, and suggestions in supporting the writer’s research.
4. Dr. Feni Munifatullah, M.Hum., as the Chief of the English Education Study Program and all lecturers of the English Education Study Program who have contributed their guidance during the completion process until accomplishing this research.

5. Nasron, S.Ag., M.M., as the Headmaster of MTsN 2 Bandar Lampung, for permitting the writer to conduct the research.
6. Misbakhun, S.Pd., as the English teacher of MTsN 2 Bandar Lampung, has helped much and given her full support for this research. Also, all the students of VIII-A for the participations as the subjects of this research.
7. To the greatest family in the world: my beloved father Suprianto, my beloved mother Endah Ari Wahyuni, and my beloved sister Ranaya Chalisthalia Priandana. Thank you so much for your support, spirit, prayers, and faith in me. Also, to my big family, thank you for always giving me the spirit and the prayers.
8. The writer's beloved partners in every condition and situation: Berliana Apriani, Laila Fadhilah Azzahra, and Ratu Mutiara Amanah who have supported this research. Thank you for the constant laughter and happiness they give the writer. The writer's college life would be monotonous without them.
9. The writer's beloved guidance friends; Husnun Hanifah, Zalfa Fadhila, Gilly Hanifah Iswari, and Wahiya Silmia have given their support and guidance in accomplishing this research. Thank you for sharing the love and laughter every single time.
10. My one-call-away friends, Rayna Syuraiha Rabbani Imran, and Victoria Alfita Santosa, thank you for always supporting, motivating, and accompanying the writer through all the ups and downs. May all the happiness always come to both of you in any way possible.
11. To all friends in the English Education Study Program 2020, especially class A and C, thank you for the beautiful, amazing, and fantastic moments we experienced together.
12. To SEEDS 2022 staff, thank you for the amazing experience and the support throughout the journey.
13. The writer's beloved online friends who cannot be written one by one, thank you for the never-ending support, love, and guidance.

Finally, the writer believes that her writing is still far from perfect. There might be weaknesses in this research. Thus, comments, critiques, and suggestions are always open for better research. Somehow, the writer hopes this research and those who want to accomplish further research almighty give us the best divine inspiration and result of research in the future.

Bandar Lampung, 28 Mei 2024

The writer,

Adinda Aurethashafa Priandana

TABLE OF CONTENTS

| | |
|---|------|
| ABSTRACT | ii |
| CURRICULUM VITAE | vii |
| DEDICATION | viii |
| MOTTO | ix |
| ACKNOWLEDGMENTS | x |
| TABLE OF CONTENTS | xiii |
| TABLE OF APPENDICES | xv |
| TABLES | xvi |
| | |
| I. INTRODUCTION | 1 |
| 1.1 Background..... | 1 |
| 1.2 Research Questions..... | 4 |
| 1.3 The Objectives | 4 |
| 1.4 The Uses | 4 |
| 1.5 The Scope | 4 |
| 1.6 Definition of Terms | 5 |
| | |
| II. LITERATURE REVIEW | 6 |
| 2.1 Previous Study | 6 |
| 2.2 Technology in EFL Learning..... | 8 |
| 2.3 Vocabulary..... | 9 |
| 2.3.1 Concept of Vocabulary | 10 |
| 2.4 Aspects of Vocabulary..... | 10 |
| 2.5 Duolingo | 11 |
| 2.5.1 Concept of Duolingo..... | 12 |
| 2.5.2 The Use of Duolingo..... | 12 |
| 2.5.3 Advantages and Disadvantages of Using Duolingo..... | 13 |
| 2.6 Duolingo in English Language Learning..... | 14 |
| 2.7 Hypotheses of Research..... | 15 |
| | |
| III. METHOD | 16 |
| 3.1 Research Design | 16 |
| 3.2 Population and Sample | 17 |
| 3.2.1 Population | 17 |

| | |
|--|--------|
| 3.2.2 Sample | 17 |
| 3.3 Procedures of Data Collecting Technique | 17 |
| 3.3.1 Pre-test | 18 |
| 3.3.2 Treatment | 18 |
| 3.3.3 Post-test | 18 |
| 3.4 Instrument of the Research | 19 |
| 3.4.1 Try-out | 19 |
| 3.4.2 Reliability of Test | 21 |
| 3.4.3 Difficulty Level | 23 |
| 3.5 Data Analysis | 24 |
| 3.5.1 Scoring the Student's Answer | 24 |
| 3.5.2 Classification of the Score | 24 |
| 3.5.3 Percentage of the Students Score | 24 |
| 3.5.4 Drawing Conclusion | 25 |
| 3.6 Data Treatment | 25 |
| 3.7 Hypotheses Testing | 25 |
| IV. RESULT AND DISCUSSION | 27 |
| 4.1 Result of the Research | 27 |
| 4.1.1 Result of Pre-test | 27 |
| 4.1.2 Result of Post-test | 28 |
| 4.1.3 Result of Normality Test | 30 |
| 4.1.4 The Difference of the Students' Vocabulary Achievement | 31 |
| 4.1.5 Result of Hypothesis Testing | 32 |
| 4.2 The Improvement of Vocabulary Aspects | 33 |
| 4.2.1 Increase of Word Classes | 33 |
| 4.2.2 Increase of Meaning | 34 |
| 4.3 Discussion | 35 |
| 4.3.1 The Implementation of Duolingo as the Media | 35 |
| 4.3.2 The Improvement of Students' Vocabulary | 36 |
| 4.3.3 The Improvement of Aspects | 37 |
| V. CONCLUSIONS AND SUGGESTIONS | 41 |
| 5.1 Conclusions | 41 |
| 5.2 Suggestions | 42 |
| REFERENCES | 43 |
| APPENDICES | 47 |

TABLE OF APPENDICES

| | |
|--|-----------|
| APPENDIX 1: Lesson Plan | 48 |
| APPENDIX 2: Lesson Plan | 54 |
| APPENDIX 3: Lesson Plan | 61 |
| APPENDIX 4: Try-out | 67 |
| APPENDIX 5: Answer Key Try-out | 71 |
| APPENDIX 6: Level of Difficulty and Discrimination Power | 72 |
| APPENDIX 7: Pre-test | 73 |
| APPENDIX 8: Post-test | 76 |
| APPENDIX 9: Students' Scores of Pre-test and Post-test..... | 79 |
| APPENDIX 10: Result of Pre-test | 80 |
| APPENDIX 11: Result of Post-test..... | 81 |
| APPENDIX 12: The Improvement of Each Aspect of Vocabulary | 82 |
| APPENDIX 13: Students' Improvement in Vocabulary Aspect | 84 |
| APPENDIX 14: T-Table Distribution | 85 |
| APPENDIX 15: Documentations..... | 86 |

TABLES

| | |
|--|-----------|
| Table 3.1 Learning Achievement..... | 20 |
| Table 3.2 Specification of word-type items | 21 |
| Table 3.3 Result of Reliability Test..... | 22 |
| Table 3.4 Result of Level of Difficulty..... | 23 |
| Table 4.1 The Distribution of Students' Achievement in Pre-test | 27 |
| Table 4.2 The Distribution Frequency of Students' Pre-test Score..... | 28 |
| Table 4.3 The Distribution of Students' Achievement in Post-test..... | 29 |
| Table 4.4 The Distribution Frequency of Students' Post-test Score..... | 29 |
| Table 4.5 Comparison of Students' Frequency Score in Pre-test and Post-test..... | 30 |
| Table 4.6 The Normality Test of Data in Pre-test and Post-test | 31 |
| Table 4.7 The Difference of Students' Vocabulary Achievement in Pre-test and Post-test..... | 31 |
| Table 4.8 The Result of Hypothesis Testing | 32 |
| Table 4.9 Comparison of Word Class in Vocabulary | 34 |
| Table 4.10 Comparison of Meaning Aspect in Vocabulary..... | 34 |

I. INTRODUCTION

This chapter indicates some points as the prior information of the research. It consists of background, research questions, study objectives, uses, scope, and definition of terms.

1.1 Background

Vocabulary is one of the most essential aspects of language skills, as well as grammar, sentence structure, punctuation, and nouns. That is why every language learner should learn and improve their vocabulary daily. Vocabulary plays the primary role in communicating, not only for speaking skills but for writing, listening, and reading skills. Developing learners' vocabulary is crucial to language development (Harmon, Wood, & Keser, 2009; Linse, 2005). According to Zimmerman, as cited in Coady and Huckin (1998), vocabulary is central to language and of critical importance to typical language learning. It stated that vocabulary is the central pillar of a building because the learner will always use vocabulary in every learning process, which involves practice and knowledge of four language skills: listening, writing, speaking, and reading. Vocabulary is also a stepping stone to higher levels of language usage and can assist students in achieving fluency more quickly (Islamovna, 2023). Vocabulary is also a critical tool for a foreigner to indicate their level of communication (Alqahtani, 2015).

As a result, if the learner masters vocabulary, it will help them use language skills properly. Besides that, mastering vocabulary helps the learner express and communicate their ideas. This justifies how crucial it is to improve the learner's vocabulary.

According to Minshar, cited in Khasawneh (2021), the weakness currently being faced in learning English is that the students are unable to speak English, and their ability to comprehend is weak. According to Susanti (2002:1), the mastery of English vocabulary is equivalent to the mastery of English ability. Students proficient in the English language's vocabulary are also adept in the language's skills. The reverse situation also has the same outcome, with students who are not proficient in English reading also not proficient in English vocabulary. As a result, occasionally, students inquire how to learn a language, its meaning, and how to remember it. In addition, some problems related to the students' motivation to learn English and vocabulary still exist nowadays. One of the problems that the teacher currently faces in MTsN 2 Bandar Lampung is the students tend to have a hard time remembering vocabulary. Thus, the students do not understand and have difficulty making a sentence, especially when talking about past events. Additionally, they lack enthusiasm for learning English since the media is monotonous. The only press they have for learning English are books and worksheets.

Accordingly, to solve the problem, the learning process should focus on interactive media to help students remember the vocabulary. One of the media that is currently famous is learning using technology. Technology has become essential to every learning process, especially English language learning as a foreign language. It has enormous educational potential within and beyond the classroom milieu, allowing learners to quickly access various instructional materials using different educational platforms (Bećirović et al., 2020). It assists and improves language learning, which aims to develop proficiency in the target language through interactive, meaningful, and cognitively engaging learning experiences. Then, the role of technology in language learning also increases students' motivation, helps them learn more, and makes them enjoy the learning process (Baytak et al., 2011).

Mobile devices have been one of the most used technologies for learning a foreign language in recent years. Montoya (2009) states that numerous elements can be included in a description of mobile language acquisition, including It is a direct offspring of m-learning, which uses mobile-accessible internet resources, and e-

learning, which is any form of learning assisted by electronic tools and resources. These mobile devices can be equipped with numerous applications that can be used to learn a foreign language (Munday, 2016). Several applications have been created to help people learn foreign languages. These apps include Lingua.Ly, HelloTalk, Cake, Memrise, and Duolingo. Duolingo is one tool that has significantly helped students build their vocabulary proficiency.

Duolingo is an online language-learning platform launched in 2012 and offers courses in 27 different world languages (Teske, 2017). The site claims to act as a private language tutor that provides individualized instruction (Duolingo, 2011) and facilitates acquiring a second language (Ahmed, 2016). Duolingo can help students improve their English language skills, such as listening, vocabulary, writing, and speaking, and can help improve their language knowledge regarding pronunciation, vocabulary, and grammar (Ahmed, 2016). Duolingo attracts the learners to remain engaged by adopting game methods. (Jašková, 2014).

In various literature, Duolingo is said to be a fun platform, and it has many benefits to support students' learning process because it could increase comfort and enjoyment and motivate students' English skills (Tiara et al., 2021). It includes simple information and allows all students to practice it fairly (Ajisoko, 2020). However, in Duolingo, sometimes the sentences are odd and unusual. Moreover, when learners learn something new, they need more explanation (Tiara et al., 2021).

Despite both favorable and unfavorable opinions, investigations have rarely been carried out on how high school students view Duolingo for vocabulary learning. The purpose of this study is to find out whether there is any significant improvement in students' vocabulary after they were taught through Duolingo. In other words, this research is to investigate which aspects improve the most after learning vocabulary through Duolingo.

1.2 Research Questions

According to the problems mentioned above, the research questions are formulated as follows:

1. Is there any significant difference in students' vocabulary after the students were taught through Duolingo?
2. Which aspect of vocabulary improved the most after the students were taught through Duolingo?

1.3 The Objectives

Referring to the problems and research questions raised above, the research aims to determine whether students' vocabulary significantly improved after the students were taught through Duolingo. In other words, this research investigates which aspects improved the most after learning vocabulary through Duolingo.

1.4 The Uses

The study could be helpful in several theoretical and practical objectives. The following are some applications of this study: Theoretically, this study is intended to provide material that other researchers can use as references and guidelines when conducting their studies on this subject. Practically speaking, this study offers opinions from students regarding their experiences using Duolingo to acquire vocabulary, which should help students decide whether or not to use it to expand their vocabulary.

1.5 The Scope

This research was conducted in MTsN 2 Bandar Lampung. The subjects were second-year students in class VIII-A. This research aims to investigate the improvement of students' vocabulary knowledge after they were taught through Duolingo. The data was collected using cluster sampling.

1.6 Definition of Terms

Unambiguous information might help readers understand the paper's contents. A few terminologies were defined to provide a fundamental comprehension of the associated ideas. They are listed as follows:

1. Vocabulary

Vocabulary is the total number of words in a language; vocabulary is a list of words available in Duolingo.

2. Duolingo

Duolingo is an online language-learning platform that provides activities to promote language acquisition. (Teske, 2017).

3. Teaching

Teaching is how a teacher guides students through the learning process. (Starkey, 2012)

II. LITERATURE REVIEW

This chapter discusses several points related to previous studies and theories about using Duolingo to support the study.

2.1 Previous Study

Several studies have been conducted on this topic. Accordingly, some relevant research concerning the use of Duolingo as a medium for language acquisition and how Duolingo could help students earn vocabulary is described further in the purpose of the references for this research.

The first study was conducted by Ajisoko (2020), which aims to investigate how the Tarakan campus of Borneo University used the Duolingo app to increase students' vocabulary. This study was conducted by using a pre-experimental design with pre-and post-tests. Ten students served as the sample group for this study, who practiced Duolingo applications for 30 days at "regular" intensity (20 XP per day). Tests and questionnaires were used as research instruments to gather data. This study also explored how Duolingo helped improve students' vocabulary. The quantitative data were used to raise student's grades. This study aimed to anticipate and provide teachers and students with knowledge on having in-depth language learning practice in a convenient style.

The second finding was based on research conducted by Ahmed (2016). This study's use of technology to encourage language acquisition is the main topic. One of the contemporary tools that makes learning a second language more accessible is Duolingo. Thus, the study tried to support the claim that Duolingo encourages novices to learn two languages simultaneously. This study used a combination of

observation, evaluation, and interview methods. It is also a case study that includes one participant who used Duolingo for two months to learn Spanish and English simultaneously. The participant is a 12-year-old male student in a school. The data were gathered, examined, and described to reach conclusions. The findings showed that Duolingo can help students learn two languages, but it has limitations.

Furthermore, Tiara et al. (2021) have researched to discuss and review previous studies about using the Duolingo application as one of the applications that supported students in English. This article also provides information about the last student's perception of the Duolingo application to help students learn English vocabulary. This study concluded that the students positively perceive using Duolingo when learning English, especially the language. It has many benefits in supporting students' learning process because it could increase, comfort, enjoy, and motivate students' English skills. Duolingo is one of the applications that motivate learning English, and it is an effective way to improve English student skills.

The following study was conducted by Anugerahwati (2023). This paper discusses the potential of Duolingo to help people become bilinguals. Being bilingual has long been considered an advantage over monolingual speakers. Based on the researcher, Duolingo is an exciting language learning application, which, according to many, is more interesting than Rosetta Stone or any other MALL app. Its wide variety of languages, added to the specific features, has succeeded in making Duolingo the most sought-after language learning application, especially for autonomous and independent learners. The nature of its gamification features and the ability to be used anytime and anywhere gives it an additional appeal.

The fifth study was conducted by Kusumadewi and Widyastuti (2018). This research aims to determine the effects of using Duolingo on student's vocabulary mastery. It is also expected to enable tutors to utilize electronic media such as Duolingo to support more modern and exciting teaching activities such as mobile or web-based applications. This research is experimental to find the effects of using Duolingo (x) on student's vocabulary mastery (y) in controlled conditions. The

experimental method used was a true-experimental design, and the researchers used Post-test Only Control. The sampling technique used by the researcher is simple random sampling, which is the experimental class VIII consisting of 30 students, as well as the control class VIII composed of 30 students. The result of student learning English with media Duolingo's Android Application has a positive effect compared to conventional student approaches.

Lastly, the study was conducted by Jaelani and Sutari (2021). In this research, questionnaire and interview were used to find out students' perceptions. This research was conducted in one junior high school in Bogor. The participants are 30 students from the second grade give positive perceptions about Duolingo application. The result of this research shows that most of students preferred learning English vocabulary using Duolingo application as a media. There are some advantages that can be taken from the use of Duolingo application as a media in learning English vocabulary, such as they are easy to understand the material, they were more excited and motivated in learning English vocabulary, Duolingo can eliminate boredom in learning and also encourage them of new idea in learning.

Based on the earlier study mentioned above, this study aims to discuss about the students' perception on using Duolingo for learning vocabulary. The difference between this study's author and other researchers is that the researcher attempts to perform new research by using a quantitative approach. The data will be collected by using questionnaire and close-ended answer.

2.2 Technology in EFL Learning

Technology is a tool that helps students learn, and it is crucial to education, particularly in the study of English as a foreign language. It is widely accepted that the development of technology has significantly impacted how people learn English. It has many advantages, including making it simpler for us to acquire different types of information and making learning more engaging and fruitful. Additionally, using technology encourages participation and allows students to tailor their learning to their interests (Shyamlee et al., 2012).

Beside that using the interactive application for learning English encouraged the students to process the meaning of the text more deeply and more actively. This interpretation suggests that the computer might provide unique opportunities for managing students' interaction with the material during the independent study. Additionally, computer-assisted language learning can enhance EFL learners' vocabulary (Saedi et al., 2012).

Student's capacity to listen, read, utilize vocabulary, talk, and write, as well as their ability to write and speak English, are all significantly impacted by technology. According to Quyen et al. (2021), technology resources may cause students' English skills to advance more. Many literary works assert that technology has a positive influence on learning English as a foreign language. Technology resources can, for example, enhance learning English (Alsulami, 2016). These include computer software, social networking sites, online movies, audio tools, and mobile applications. Then, ESL students can practice their oral communication skills independently with the use of effective online tools to enhance their English-speaking ability, sense of learning autonomy, and confidence (Rodrigues et al., 2015).

2.3 Vocabulary

Vocabulary is considered a fundamental component of language proficiency and is essential for effective communication and language comprehension.

Vocabulary is the first and most fundamentally significant component of learning English for beginners. The learners' ability to communicate effectively in writing and orally will increase as they gain vocabulary ability. Reading, writing, speaking, and listening are the four primary English language abilities that vocabulary will aid in communication. Vocabulary, as stated by Rivers reported in Nunan (1991: 117), is crucial for successful second language use since, without a large vocabulary, learners will not be able to apply the structures and functions they may

have learned for understandable communication. According to the studies, vocabulary aids in the growth of reading comprehension. Low vocabulary levels frequently correlate with poor comprehension, while high vocabulary scores frequently correlate with strong comprehension.

Based on the explanation above, it can be concluded that vocabulary is one of the essential parts of English because without vocabulary, we cannot be able to communicate and low vocabulary correlate with poor comprehension. The more vocabulary, the more the speaker can communicate well.

2.3.1 Concept of Vocabulary

The concept of vocabulary, according to experts in linguistics and education, generally refers to the set of words and lexical items that a person knows and uses in a particular language. It encompasses a range of words, including nouns, verbs, adjectives, adverbs, and other parts of speech, along with their meanings, pronunciation, and usage.

There has been discussion about categorization of vocabulary. Both active and passive vocabulary are separated into different categories. The two categories of vocabulary were identified by Gruneberg and Sykes in 1991. The students were expected to be able to employ the language that they had been taught, which was the first kind of vocabulary. The second one, on the other hand, dealt with terms that the pupils would likely be able to recognize when they encountered them but presumably be unable to pronounce. Receptive vocabulary and productive vocabulary are the two categories of vocabulary mentioned by Hatch and Brown (1995). Receptive vocabulary refers to words that students can recognize and comprehend when they are used in context but cannot produce on their own.

2.4 Aspects of Vocabulary

In learning vocabulary, there are some aspects that the learners should acquire. According to Nation (2001), the aspects of vocabulary that can be acquired by the

learners are divided into two frameworks, which are: (a) what is a word? & (b) what is involved in learning a word?

According to the questions above, vocabulary was divided into 3 aspects; Meaning, Form, and Use. Based on Nation (2001), the aspect of meaning contains form and meaning, concepts, and references. In learning a foreign language, students should know the meaning of the word. Knowing the meaning of the word will make it easier for students to use it for written or oral communication. Students should acknowledge the meaning behind a word to avoid misunderstanding.

The aspect of the form contains spoken, written form, and word parts. In learning foreign language, students should acknowledge the exact form of the vocabulary since it will affect the students' knowledge in learning English also their skill in speaking, reading, writing, and even listening. Spoken and written form, in this context, contains spelling and pronunciation of the vocabulary. Form also a category of words such as nouns, verbs, adverb, adjectives and preposition. Form is an important feature in semantic analysis.

The third aspect is use, this aspect includes grammatical functions, collocations, and constraints on use. Word use is how a word, phrase, or concept is used in a language. Lexicographers gather samples of written or spoken instances where a word is used and analyze them to determine patterns of regional or social usage as well as meaning.

2.5 Duolingo

As teachers, we may benefit from the use of media in vocabulary instruction to help students learn more vocabulary and become more knowledgeable about it. An application called Duolingo is among the various media that educators may employ. In June of 2012, Duolingo was introduced. It is an app that uses games to teach language acquisition.

2.5.1 Concept of Duolingo

Duolingo is a free language learning app created by Luis Von Ahn and Severin Hacker was launched in November 2011, and offers 68 different language courses in 23 Languages, with 22 additional courses still under development. It currently offers 68 distinct language courses in 23 different languages, with 22 more still being developed. For users who have reached a specific level, Duolingo offers speaking practice, dictation, and written study. Applications for iOS, Android, and Windows Phone are created in a way that users can keep enhancing their capacity to communicate anytime, anywhere. With Duolingo, learning is made to be appealing and simple to grasp. For the innovation, Duolingo was awarded Google Play's Best of the Best 2013 by Google because of the powerful gamification techniques used to get many people to learn new knowledge (Kusumadewi & Widyastuti, 2018).

2.5.2 The Use of Duolingo

Duolingo is highly helpful for anyone learning English as well as several other languages, including Spanish, Italian, German, and Turkish. It operates in a very straightforward manner. It can be used for at least five minutes each day, and consumers can decide how they want to utilize it right away. During the learning process in Duolingo, the four skills—reading, writing, listening, and speaking—are present through the development of questions, affirmative and negative sentences, brief texts and excerpts to be heard and transcribed, and the students have the option to record their own pronunciation to assess their oral performance (Widiyanti, 2019).

Language learners can choose from a variety of languages, including English, Arabic, Spanish, French, Dutch, and others, according to the Duolingo Guidebook (2015). Additionally, it provides a forum for educators where users, whether they are teachers or students, may exchange lesson ideas and learning experiences with one another to facilitate learning. It provides the most accurate means of assessing pupils' achievements and dedication. It provides details on topics like the number of points earned, the streak, the amount of time spent, and the course outline tree.

For those starting out and learning a new language from scratch, Duolingo's learning options are so diverse and practical. It is simple to use because the usage directions are uncomplicated.

2.5.3 Advantages and Disadvantages of Using Duolingo

Duolingo Translate is a machine translation tool that many people may easily access for free. There are both good and bad effects of using Duolingo as a method for learning English on people's life.

The first advantage of using Duolingo is advantages the students were very independent in doing the exercise in the application. According to Yusda et al. (2020), Duolingo was very helpful for students because it helps the student to understand more about the new vocabulary Therefore, students were more active in conducting vocabulary practice through Duolingo, but they still need to be controlled by teachers to question the truth or clarity of the use of the vocabulary they get from Duolingo. In the section, new vocabulary with all the forms that students got during the lesson can be seen in the time of the last exercise, and students have successfully used the vocabulary.

The students could easily see the level and size of their vocabulary and the knowledge of each word. Students could practice the words individually and saw some examples of sentences or other examples. Duolingo provides some levels, namely beginner level, middle level, and advanced level. From the levels, there are many material topics in it.

According to Jaskova (2014: 29), Duolingo features a special page to filter student vocabulary levels since it highlights a number of gamification-related aspects of learning and can engage and drive students to study using Duolingo (Munday, 2015, p.88).

Duolingo has a big advantage in comparison with other language tools. It is for free and therefore available for everyone. This means its potential audience is enormous, encompassing anyone with a computer. In addition, in recent years the system was

made accessible by iPads and iPhones and they plan to make it accessible by mobile phones, which would increase its reach by an enormous number of potential users. (Jašková, 2014).

2.6 Duolingo in English Language Learning

One of the key resources' students require to assist them in learning the English language is Duolingo. Because of its affordable and useful features, it has also risen to the top of the list of applications used by students to study languages. According to various research studies, Duolingo can be helpful for acquiring English language skills such as speaking, listening, and vocabulary ability.

First, according to the study conducted by Yusda et al. (2020), Duolingo is useful for improving student vocabulary. What's more, this application can be used anywhere and anytime on a Smartphone so that it makes learning more practical. It helped the students to learn in independent way.

Second, a study conducted by Tiara et al. (2021), the process of language learning will be more exciting and enjoyable with the Duolingo application. Therefore, it can develop student knowledge about English vocabulary. It has many benefits to support students' learning process because it could increase, comfortable, enjoy, and motivate students' English skills. Duolingo is one of the applications that give motivation in learning English then it is an effective way to improve English student skills.

Third, the study by Irzawati et al. (2023), According to the results, students had favorable impressions and attitudes toward the usage of Duolingo for learning English as a Foreign Language (EFL). They thought Duolingo made learning English simple, enjoyable, interesting, and motivating. According to this study, language instructors should incorporate Duolingo into EFL instruction for its advantages. However, it is crucial to prepare for probable difficulties and carry out more research on the efficiency of utilizing Duolingo to improve students' English skills. To learn more about the efficacy of Duolingo, future researches should

concentrate on four language abilities and three language aspects. The study's authors wish to convey their appreciation to everyone who helped make it possible to complete it, especially the willing volunteers.

Lastly, the study conducted by Anugerahwati (2023), Duolingo has become the most popular language learning program, especially for independent and autonomous learners because of its large selection of languages and unique features. It also has an added attraction due to the nature of its gamification aspects and its portability. It helps learner to learn more about English language.

2.7 Hypotheses of Research

Based on the theoretical assumption elaborated above, the researcher formulated the hypothesis that was tested in this study as follows:

1. H1: There is a significant difference of students' vocabulary after the students were taught vocabulary through Duolingo as the media.

III. METHOD

This chapter discusses the research method, including research design, population and sample, data collecting technique, research procedures, instrument, validity and reliability of the research instrument, and data analysis. The research method plays a significant role in conducting research until the results are obtained.

3.1 Research Design

Research design refers to the framework of research methods and techniques a researcher utilizes to carry out research to solve research questions by collecting, interpreting, analyzing, and discussing the data. According to Creswell (2004), research design is the specific procedure involved in the research process: data collection, data analysis, and report writing.

This study employed a descriptive quantitative method. Quantitative descriptive research is a method used to examine a population or a specific sample which uses research instruments to collect the data and analyze the data quantitative or statistical to describe and test specified hypotheses (Sugiyono, 2013). Setiyadi (2006: 5) stated that quantitative design aims to examine an existing theory and that the researcher should seek evidence to either support or refute it.

The one-group pre-test post-test design was suggested by Setiyadi (2006).

Following is an illustration of the design:

| |
|----------------|
| T1 X T2 |
|----------------|

T1 : Pre-test

X: Treatment

T2 : Post-test

In this study, the researcher conducted survey research as it is appropriate for assessing thoughts, opinions, and feelings. Survey research is used to obtain data from certain natural (non-artificial) places. Still, researchers carry out treatments to collect the data, such as distributing questionnaires, tests, structured interviews etc (Sugiyono 2013).

3.2 Population and Sample

In this study, the population and the sample of the study were classified based on the following criteria:

3.2.1 Population

Population is the whole object of research. It is the entire group consisting of people with a specialized set of characteristics and qualities determined by researchers to draw conclusions about. The population of this study was one out of 11 classes of second-year students in MTsN 2 Bandar Lampung.

3.2.2 Sample

A sample is a part of population that contains the characteristic of the population. In conducting research, it is essential to determine a sample as the research participants and purposive sampling is used as the technique sampling in selecting research participants. Purposive sampling is a technique used to determine a sample from a population that has specific characteristics in accordance with the research objective, which is expected to be able to answer the research question. In this research, the second-year students, which is class VIII-A in MTsN 2 Bandar Lampung, were the sample of this research.

3.3 Procedures of Data Collecting Technique

Procedures of data collecting technique explain the systematic process of gathering the data in research. The process of gathering data will be described below:

3.3.1 Pre-test

The researcher gave the students a vocabulary test consisting of 25 questions related to vocabulary that is commonly used in daily life, especially about past activities.

3.3.2 Treatment

After the researcher gave the vocabulary test, the researcher used Duolingo as the media for learning vocabulary. The activities for the treatment were as follows:

1. The teacher gave a vocabulary test to students by giving them multiple-choice tests and the test consisted of 25 questions.
2. After giving the vocabulary test, the teacher explained about Duolingo as the media for learning vocabulary.
3. Then, the teacher gave a treatment by using Duolingo as the media for the students to learn vocabulary.
4. The teacher showed and instructed how to use Duolingo. All students had to learn vocabulary from the material given in Duolingo.
5. After this, each student should remember the vocabulary and answer the question from the teacher about the vocabulary.
6. For the post-test, the researcher gave a multiple-choice test consisting of the vocabulary learned in Duolingo.
7. The limited time for the students to answer the question is 45 minutes.
8. Checked the correct answer from their tasks.

After the researcher conducted treatment, the students were asked to answer a vocabulary test for the post-test.

3.3.3 Post-test

After applying Duolingo as the media for learning vocabulary, the researcher conducted a vocabulary test for post-test to measure students' vocabulary knowledge. The result of the post-test was used to measure whether there was a

significant difference in students' vocabulary knowledge after the students were taught through Duolingo or not.

3.4 Instrument of the Research

In this section, two parts will be discussed further: validity and reliability. In conducting research, checking the validity and reliability is a must for the researcher. As mentioned by Setiyadi (2006), the quality of a test can be seen from the quality of the instrument's validity and reliability.

3.4.1 Try-out

The try-out was conducted to measure the reliability and the quality of the instrument for pre-test and post-test. The test should be tested to determine whether the items are good or bad, appropriate for the test, and valid. The try-out used 40 vocabulary test items consisting of multiple-choice questions.

3.4.1.1 Validity of Test

According to Heaton et al. (1991), validity is the extent to which it measures what it is supposed to be measured. Meanwhile, according to Farhady & Hatch (1982) validity is the extent to which an instrument really measures the objective to be measured and suitable with the criteria. In quantitative research, one of the main criteria for researching results was validity. It has described that "Validity is the degree of accuracy between the data that occurred in the object of research with the power that can be reported by the researcher." Actually, the thing that should be valid is the instrument in the research. There were several provisions or aspects of validity that should be checked in declaring whether one of the test instruments is valid or not. Product moment correlation by Pearson in the SPSS program can be used to test the validity of the test. The validity of a test shows how far the test measures what is supposed to be measured (Setiyadi, 2006). Hatch and Farhady (1982:281) added that there are two basic types of validity; content validity and

construct validity. In order to measure whether the test has a good validity, those two types of validity are going to be analyzed, such as:

a. Content Validity

Haynes et al. (1995) define content validity as the extent to which elements of an assessment instrument are relevant to a representative of the target concept for a particular assessment purpose. The focus of content validity was on sample adequacy rather than test appearance alone.

Finding out if the exam fairly represented the content taught was the aim of content validity. The instructional materials must match the exam that is given to meet the content validity requirement. According to Brown (2000), content validity encompasses all validity procedures that focus on the content of the test. To establish content validity, the researcher looked at how well a test represented the content of the objectives or requirements for which it was originally prepared. To evaluate the degree of fit, the researcher used the syllabus to judge how well the test items matched the test objectives.

The researcher used the learning achievement of the lesson plan in Table 3.1

Table 3.1 Learning Achievement

| Learning Achievement |
|---|
| Students may identify verbs employed in assignments to convey information about activities that are done or occur, routine or not routine, or become common truths in the past based on the context of usage. |

(Source: Appendix 1. Lesson Plan, p. 49)

The content word falls into four categories: noun, verb, adjective, or adverb. Based on the previously indicated concept, students' competency in vocabulary acquisition was evaluated through a vocabulary exam. In this case, the content word was the exam subject. They are verbs, adverbs, and adjectives. There is no noun-related question item in this test due to Duolingo's limited material in the Past Tense Chapter. The distribution of the word type in the vocabulary test can be seen from the table of specifications below:

Table 3.2 Specification of word-type items

| No. | Word Type | Items | Total | Percentage |
|-------|-----------|---|-------|------------|
| 1. | Verb | 1, 2, 3, 4, 5, 8, 9, 11, 13, 14, 15, 16, 19, 20, 22, 23, 26, 38 | 18 | 45% |
| 2. | Adverb | 27, 28, 30, 32, 37, 39 | 6 | 15% |
| 3. | Adjective | 6, 7, 10, 12, 17, 18, 21, 24, 25, 29, 31, 33, 34, 36, 40 | 15 | 37,5% |
| 4. | Noun | 35 | 1 | 2,5% |
| Total | | | 40 | 100% |

b. Construct Validity

Construct validity refers to how well the test matches the definition of what it means to be a language learner (Shohamy et al. 1985:74). It suggests that construct validity may be found by relating the instrument to the idea of what it means to have specific knowledge capacities. Additionally, the English vocabulary is separated into functional and content categories by Hatch and Brown (2001). In this study, the researcher also utilized expert judgment to determine whether the goods were good or not. Construct validity can be determined via judgment from experts (Sugiyono, 2013). It was accomplished by requesting that the advisers analyze the relevance of each item in the instrument based on the instruments' intended purpose, as well as make recommendations for the elements that were deemed less relevant.

3.4.2 Reliability of Test

According to Hatch and Farhady (1982), reliability refers to the extent to which the test is consistent in its score and gives us an indication of how accurate the test scores are. To complete the reliability aspects which are concerned with the consistency of measurement of research, the researcher has to measure the same research subjects a different time and give consistent results. Although it is not

possible to give an exact calculation of reliability, an estimate of reliability can be achieved through different measures.

The try-out was administered to find out the quality of the instrument that will be used in both pre-test and post-test. In this research, the researcher used SPSS 26 and scored using the Gutman Split Half Coefficient. According to Fraenkel et al. (2012), the score is deemed trustworthy when the test score has a reliability value of at least 0.70.

The result of the reliability test for vocabulary test in this research is described below in Table 3.3

Table 3.3 Result of Reliability Test

| Reliability Statistics | | | |
|--------------------------------|------------------|------------|----------------|
| Cronbach's Alpha | Part 1 | Value | 1.000 |
| | | N of Items | 1 ^a |
| | Part 2 | Value | 1.000 |
| | | N of Items | 1 ^b |
| | Total N of Items | | 2 |
| Correlation Between Forms | | | .579 |
| Spearman-Brown Coefficient | Equal Length | | .733 |
| | Unequal Length | | .733 |
| Guttman Split-Half Coefficient | | | .709 |

a. The items are: X (Odd)

b. The items are: Y (Even)

The result of the reliability test was 0.709. The result was based on the criteria of reliability proposed by Arikunto (2006); the result of the test was accepted and can be used as the instrument of the study since it can produce consistent results from the same participant when it was administered under similar condition (Hatch and Farhady, 1982). As a result, the test fulfilled the reliability criteria.

3.4.3 Difficulty Level

The level of difficulty is determined by how easy or difficult the item is, as well as the number of right answers from students who take the exam. The formula employed in this research was as follows:

$$LD = \frac{U+L}{N}$$

Where:

LD : Level of difficulty

U : The number of upper group students who answer correctly

L : The number of lower group students who answer correctly

N : The total number of students following the test

The criteria are:

< 0.30 : Difficult

0.30 – 0.70 : Average

>0.70 : Easy

(Shohamy, 1985)

In determining the level of difficulty of each item, the researcher employed a Microsoft Excel formula. According to the results, 25 questions were included in the average and easy criterion, with values ranging from 0.45 to 1. Meanwhile, 15 questions had a score of less than 0.45. The result of the calculation contains the full findings of each item's level of difficulty calculation can be seen in Appendix 6 (p. 71). Table 3.4 illustrates 15 questions with tough requirements.

Table 3.4 Result of Level of Difficulty

| Items | Level of Difficulty | Criteria |
|-------|---------------------|-----------|
| 4 | 0.95 | Easy |
| 8 | 1 | Easy |
| 11 | 0.9 | Easy |
| 13 | 1 | Easy |
| 15 | 1 | Easy |
| 16 | 1 | Easy |
| 17 | 0.9 | Easy |
| 18 | 1 | Easy |
| 20 | 0.15 | Difficult |
| 23 | 0.075 | Difficult |
| 24 | 1 | Easy |
| 25 | 1 | Easy |

| | | |
|----|------|------|
| 26 | 0.95 | Easy |
| 35 | 0.95 | Easy |
| 37 | 0.9 | Easy |

Source: Shohamy (1985)

3.5 Data Analysis

The data was collected from pre-test and post-test. The researcher used analysis scoring to determine the improvement of Junior High School students' vocabulary before and after they were taught and learned vocabulary by using Duolingo as the media at MTsN 2 Bandar Lampung. In analyzing the data collected through the pre-test and post-test, the formula that was used as follows:

3.5.1 Scoring the Student's Answer

Based on Arikunto (2021), the researcher employs the scoring system to determine students' pre-test and post-test results. The formula can be illustrated as follows.

$$\text{Score} = \frac{\text{The coorrect answer}}{\text{Total of number of item}} \times 100$$

3.5.2 Classification of the Score

The results of both tests should be classified into the following classification:

| No | Score | Classification |
|----|--------|----------------|
| 1. | 86-100 | Very Good |
| 2. | 71-85 | Good |
| 3. | 56-70 | Fair |
| 4. | 41-55 | Poor |
| 5. | < 40 | Very Poor |

3.5.3 Percentage of the Students Score

In order to calculate the rate percentage of students' scores, the researcher used the formula as follows:

$$P = \frac{FN}{N} \times 100 \%$$

Notes:

P = Percentage
 F = Frequency
 N = Total Number of Sample

3.5.4 Drawing Conclusion

The conclusion is based on the data tabulation results. It was statistically analyzed using a paired sample t-test from SPSS to determine whether the increase in student gains was significant.

3.6 Data Treatment

The data were analyzed by using the Repeated Measure T-test. It is used to find out the means of pre-test and post-test and how significant the improvement was. According to Setiyadi (2006), three basic assumptions should be fulfilled in using Repeated Measure T-test analysis to examine the hypotheses:

1. The data are an interval.
2. The data are taken from a random sample in the population (non-absolute).
3. The data are distributed normally.

3.7 Hypotheses Testing

Based on the theoretical assumption elaborated above, the researcher formulated the hypothesis that was tested in this study as follows:

1. H0: There is no significant difference between junior high school students' vocabulary achievement after the students were taught through Duolingo as the media.
2. H1: There is a significant difference between junior high school students' vocabulary achievement after the students were taught through Duolingo as the media.

The researcher used a Repeated Measure T-test to determine whether the hypothesis was accepted or rejected. The criteria for the hypothesis are:

- a. H_0 is rejected if the significant (p) value is less than the significant level (0.05) and the t-value is more than t-table. It indicates that there is a significant difference between junior high school students' vocabulary achievement after the students were taught and learned vocabulary through Duolingo as the media.
- b. H_0 is accepted if the significant (p) value is more than the significant level (0.05) and the t-value is more than the t-table. It indicates that there is no significant difference between junior high school students' vocabulary achievement after the students were taught and learned vocabulary through Duolingo as the media.

In summary, the quantitative method was used to answer the research question in this research which is the improvement of junior high school students' vocabulary after the students were taught and learning vocabulary through Duolingo as the media. It is intended to find the comparison between students' vocabulary knowledge without learning using Duolingo and with using Duolingo. Students were tested using pre-test and post-test.

V. CONCLUSIONS AND SUGGESTIONS

This chapter provides conclusions based on the study findings and comments from the preceding chapter. It also includes some tips for English teachers and academics who want to use Duolingo as a vocabulary teaching media.

5.1 Conclusions

In line with the results of the data analysis and discussion, the writer comes to the following conclusion:

1. Duolingo enhances students' language mastery. There is a significant difference in the students' vocabulary achievement, which is taught by using Duolingo. The result shows that the mean score of the post-test is significantly higher than in the pre-test. The student's mean score increased from 66.11 to 78.89, which is a gain of 12.78. In addition, the result of the hypothesis shows that the significant level is 0.00, and it was lower than sig a <0.05 . It indicates that the H_0 which is; there is a significant difference between junior high school students' vocabulary after the students were taught and learned vocabulary through Duolingo as the media is accepted.
2. Duolingo improves word classes and meaning in vocabulary. There is a significant difference in students' vocabulary achievement in word classes and meaning. This can be seen from the mean score of word classes, which increased from 71.2 to 84.35 while the meaning aspect improved from 66.11 to 78.89. Therefore, it can be concluded that Duolingo can help the students improve their vocabulary knowledge, especially in word classes. In addition, the students can also understand the meaning of the words they learned in Duolingo.

Based on the findings, the researcher suggests that Duolingo may be used to help students improve their vocabulary. Duolingo may also be a useful and pleasant way for students to learn a language.

5.2 Suggestions

Based on the findings, the researcher proposes to offer the following suggestions:

1. English teachers are encouraged to employ Duolingo as an alternative media for teaching vocabulary. Duolingo may teach students to remember both the provided term and the new phrase while having fun. Thus, students may be motivated to extend their vocabulary.
2. The researcher suggests that teachers be creative in their use of Duolingo, concentrating not just on increasing meaning but also on other factors such as word selection. For example, the instructor gives various exercises to the students. One example is that a teacher can give some exercises using fill-in-the-blank questions or ask them to produce a sentence.
3. Further research should be conducted at other student levels, as this study only examined the usage of Duolingo to increase students' vocabulary knowledge at the junior high school level. Because the approach is acceptable for students of all ages, more studies might be conducted at the elementary, senior, or college levels.

REFERENCES

- Ajisoko, P. (2020). The use of Duolingo apps to improve English vocabulary learning. *International Journal of Emerging Technologies in Learning (iJET)*, 15(7), 149-155.
- Akande, S. O. (2009). Knowledge, perception, and attitudes of library personnel towards preservation of information resources in Nigerian Federal University Libraries. *Library Philosophy and Practice (e-journal)*, 303, 1-8.
- Alqahtani, M. (2015). The importance of vocabulary in language learning and how to be taught. *International journal of teaching and education*, 3(3), 21-34.
- Alsulami, S. (2016) The Effects of Technology on Learning English as a Foreign Language Among Female EFL Students at Effatt College: An Exploratory Study. *Canadian Academy of Oriental and Occidental Culture*. Vol. 12, No. 4, 2016, pp. 1-16
- Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). How learning works. John Wiley & Sons.
- Anugerahwati, M. (2023). Can Duolingo Help People Master a Foreign Language? *KnE Social Sciences*, 8(7), 133–139 <https://doi.org/10.18502/kss.v8i7.1324>
- Arikunto, S. (2006). Prosedur penelitian tindakan kelas. *Bumi aksara*, 136(2), 2-3.
- Bahjet Essa Ahmed, H. (2016). Duolingo as a bilingual learning app: a case study. *Arab World English Journal (AWEJ)* Volume, 7.
- Baytak, A., Tarman, B., & Ayas, C. (2011). Experiencing technology integration in education: children's perceptions. *International Electronic Journal of Elementary Education*, 3(2), 139-151
- Bećirović, S., Brdarević-Čeljo, A., & Delić, H. (2021). The use of digital technology in foreign language learning. *SN social sciences*, 1, 1-21.
- Bahrudin, U., & Febriani, S. R. (2020). Student's perceptions of Arabic online learning during COVID-19 emergency. *Journal for the Education of Gifted Young Scientists*, 8(4), 1483-1492.

- Chau, T. Q., & Nguyen, T. T. H. (2021). A theoretical study on the genuinely effective technology application in English language teaching for teachers and students. *AsiaCALL Online Journal*, 12(5), 17-23.
- Chen, X. (2016). Evaluating Language-learning Mobile Application for Second-language Learners. *Journal of Educational Technology Development and Exchange (JETDE)*. DOI: 10.18785/jetde.0902.03
- Creswell, J. W. (2004). *Research Design: Qualitative, Quantitative, and Mixed Method Approaches*. California: Sage Publications.
- de Castro, A. P., da Hora Macedo, S., & Pinto Bastos, H. P. (2016). Duolingo: An Experience in English Teaching. *Journal of Educational & Instructional Studies in the World*, 6(4).
- Duolingo. (2011). <https://www.duolingo.com/>
- Fengyu, Z. (2023). The Impact of Vocabulary Learning Methods on Students' Vocabulary Application Skills. *English Language Teaching and Linguistics Studies* ISSN 2640-9836 (Print) ISSN 2640-9844 (Online) Vol. 5, No. 4, 2023.
- George, D., & Mallery, M. (2003). Using SPSS for Windows step by step: a simple guide and reference.
- Groot, P. J. M. (2000). Computer Assisted Second Language Vocabulary Acquisition. *Language Learning & Technology*. Volume 4, Number 1 pp. 56-76 online.
- Hatch, E., & Brown, C. (1995). *Vocabulary, semantics, and language education*. Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211 (hardback: ISBN-0-521-47409-4; paperback: ISBN-0-521-47942-8).
- Hatch, E., & Farhady, H. (1982). Research design and statistics for applied linguistics.
- Haynes, S. N., Richard, D., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological assessment*, 7(3), 238.
- Heaton, R. K., Grant, I., & Matthews, C. G. (1991). *Comprehensive norms for an expanded Halstead-Reitan Battery: Demographic corrections, research findings, and clinical applications*. Psychological Assessment Resources.
- Hornby, A.S. 1995. *Advance Learner's Dictionary*. New York: Oxford University Press

- Irzawati, I., & Unamo, A. F. (2023). Students' Perceptions and Attitudes towards the Utilization of Duolingo in EFL Learning. *J-SHMIC: Journal of English for Academic*, 10(2), 123-138.
- Jašková, J. (2014). *Duolingo as a new language-learning website and its contribution to e-learning education* (Doctoral dissertation, Masarykova univerzita, Pedagogická fakulta).
- Jaelani, A., & Sutari, D. R. (2021, January). Students' Perception of Using Duolingo Application as a Media in Learning Vocabulary. In *Bogor English Student and Teacher (BEST) conference* (Vol. 2, pp. 40-47).
- Jeong, K. O. (2017, February). University Students' Perception and Motivation of Using Digital Applications as Effective English Learning Tools. In *2017 International Conference on Platform Technology and Service (PlatCon)* (pp. 1-4). IEEE.
- Karjo, C. H. & Andreani, W. (2018). Learning Foreign Languages with Duolingo and Memrise. *ICDEL '18 Proceedings of the 2018 International Conference on Distance Education and Learning*. p. 109-112. DOI:10.11453231848.3231871
- Khasawneh, M. A. S. (2021). Language skills and their relationship to learning difficulties in English language from the students' point of view. *Science and Education*, 2(9), 261-272.
- Krashen, S. D. (1982). *Principles and Practice in Second Language Acquisition*. New York: Pergamon Institute of English.
- Kusumadewi, H., & Widyastuti, M. (2018). The effects of using Duolingo towards student's vocabulary mastery. *IJET*, 7(2), 172-186.
- Mardianawati, L. I. E. S. (2012). Vocabulary Teaching Strategies Used by Teachers of Junior High School. *Unpublished Bachelor Thesis, Purwokerto: Muhammadiyah University of Purwokerto*, 11.
- Montoya, M. S. R. (2009). Recursos tecnológicos para el aprendizaje móvil (mlearning) y su relación con los ambientes de educación a distancia: implementaciones e investigaciones. *RIED. Revista iberoamericana de educación a distancia*, 12(2), 57-82.
- Munday, P. (2017). Duolingo. Gamified learning through translation. *Journal of Spanish Language Teaching*, 4(2), 194-198.
- Nation, I.S.P. (1990). *Teaching and Learning Vocabulary*. New York: Newbury House.
- Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge:

- Cambridge University Press. <https://doi.org/10.1017/CBO9781139524759>
- Nation, I. S. P. (2001). Learning vocabulary in another language. *Cambridge: Cambridge University Press*. <https://doi.org/10.1017/CBO9781139524759>
- Nunan, D. (1991). Methods in second language classroom-oriented research: A critical review. *Studies in second language acquisition*, 13(2), 249-274.
- Rijkhoff, J. (2007), Word Classes. *Language and Linguistics Compass*, 1: 709-726. <https://doi.org/10.1111/j.1749-818X.2007.00030.x>
- Rodrigues, P. D. & Vethamani, M. E. (2015). The Impact of Online Learning in the Development of Speaking skills. *Journal of Interdisciplinary Research in Education*, 5 (1), 43-67.
- Setiyadi, A. B. (2006). Metode penelitian untuk pengajaran bahasa asing: Pendekatan kuantitatif dan kualitatif.
- Shohamy, E., & Reves, T. (1985). Authentic language tests: where from and where to?. *Language Testing*, 2(1), 48-59.
- Shyamlee, S. D., & Phil, M. (2012, March). Use of technology in English language teaching and learning: An analysis. In *International Conference on Language, Medias and Culture* (Vol. 33, No. 1, pp. 150-156).
- Sugiyono. (2013). Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta
- Sutarsyah, C. (2021). *Vocabulary in Language Research*. Textium.
- Teske, K. (2017). Duolingo. *Calico Journal*, 34(3), 393-401.
- Tiara, A. D., Rahman, M. A., & Handrianto, C. (2021). The students perception about use of duolingo application for improving english vocabulary. *International Journal of Education, Information Technology, and Others*, 4(4), 690-701.
- Yousefi, S., Saedi, M., & Abbaspour, M. (2012, July). Analytical framework for safety level evaluation of periodic-based safety applications in Vehicular ad hoc networks. In *2012 International Conference on Computer and Communication Engineering (ICCCCE)* (pp. 408-413). IEEE.
- Yusda, D. D., Nanda, D. S., Pratiwi, T. L. M., & Haninun, H. (2020). An Analysis of Using Duolingo Application in Improving Students' Vocabulary Mastery at 10th Grade of SMA YADIKa Bandar Lampung. *BEYOND LINGUISTIKA (Journal of Linguistics and Language Education)*, 3(2).