IMPROVING STUDENTS' VOCABULARY MASTERY BY USING DUOLINGO OF THE EIGHTH GRADE AT SMPS BUDI UTOMO

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ABSTRACT
The study aimed to investigate the improvement of English vocabulary mastery among eighth-grade students at Budi Utomo junior high school using the Duolingo application. The research involved 41 students and used descriptive and statistical techniques to analyze data. Qualitative data was collected from interviews, observations, and documentation, while quantitative data was gathered from students' test results, both orientation and post-test. The results showed that students were enthusiastic and active in the learning process, feeling happy and discussing with each other. They easily mastered vocabulary, which influenced their test results. The statistical analysis showed an increase in students' scores from the orientation test to post-test, with a mean score of 48. The number of students achieving the KKM score also increased. In the orientation test, only 4.9% of students achieved the KKM score, but in the post-test of cycle I, 87.8% of students achieved it, and in the post-test of cycle II, 100% of students achieved or exceeded the KKM score. In conclusion, the Duolingo application significantly assisted students in improving their English vocabulary mastery in a fun and satisfying manner.
Keywords: Improving, Vocabulary Mastery, Duolingo

ABSTRAK
Penelitian ini bertujuan untuk menyelidiki peningkatan penguasaan kosakata Bahasa Inggris di kalangan siswa kelas delapan di SMPS Budi Utomo menggunakan aplikasi Duolingo. Penelitian melibatkan 41 siswa dan menggunakan teknik deskriptif dan statistik untuk menganalisis data. Data kualitatif dikumpulkan melalui wawancara, observasi, dan dokumentasi, sedangkan data kuantitatif diperoleh dari hasil ujian siswa, baik ujian orientasi maupun post-tes. Hasil penelitian menunjukkan bahwa siswa antusias dan aktif dalam proses pembelajaran, merasa senang dan berdiskusi satu sama lain. Mereka dengan mudah menguasai kosakata, yang mempengaruhi hasil ujian mereka. Analisis statistik menunjukkan peningkatan skor siswa dari ujian orientasi hingga post-test, dengan skor rata-rata sebesar 48. Jumlah siswa yang mencapai skor KKM juga meningkat. Pada ujian orientasi, hanya 4,9% siswa yang mencapai skor KKM, tetapi pada post-tes siklus I, 87,8% siswa mencapainya, dan pada post-tes siklus II, 100% siswa mencapai atau melebihi skor KKM. Kesimpulannya, aplikasi Duolingo secara signifikan membantu siswa meningkatkan penguasaan kosakata bahasa Inggris mereka dengan cara yang menyenangkan dan memuaskan.
Kata Kunci: Peningkatan, Penguasaan Kosakata, Duolingo

INTRODUCTION

Mastery of English includes four main skills, namely listening, speaking, reading, and writing. The main component that must be learned in a language to support the mastery of those skills is vocabulary no matter what language it is. Vocabulary is an inseparable part of any language learning process (Rosanti et al., 2022). It would be impossible to learn a language without vocabulary. Thus, vocabulary is very important to be mastered. Considering the importance of mastering vocabulary particularly for junior high school, therefore, the government issues some policies to put English into the curriculum.

The teaching of vocabulary in junior high school is not very easy. Teachers still found difficulties or problems during the teaching learning process. Since mastering vocabulary is very important aspects to support other language skills, therefore, when the students are unable to master the vocabulary, they will not be able to engage in teaching learning process. This is in line with the statement by Fauziati (2010), that when the students unable to improve their vocabulary, they slowly lose interest in learning and this affects their learning efforts and learning outcomes. It can be concluded that interest, ability and learning outcomes are closely related. As stated by Dalyono (2001), a lack of students' interest in a lesson will cause learning difficulties.

Those problems were observed by the researcher through the results of student exams. The students did not reach the minimum completeness criteria *(KKM: Kriteria Ketuntasan Minimum)* that is 75. The researcher found facts about students' scores during the final test conducted by the school. The lowest score was 7 and the highest score was 51 out of 41 students. These scores are still very far from the target or criteria that must be achieved by students. Reviewing the scores on the students' mid-test, which showed that there were still some students who managed to get scores above 75. This indicated that there has been a decline in student achievement and this was experienced by all students, even the smartest students in the class.

The causes of the students did not achieve the minimum KKM due to some facts that students were unable to answer the questions not only because the students did not know what the answers to these questions were, but also they did not know what the meaning of the questions. Those were due to the limited vocabulary possessed by students.

The limited vocabulary can be caused that English has different writing and pronunciation. In addition grammar also affects the amount of vocabulary, for example the word "pergi" can have three different form in English depending on the time it occurs, go, went and gone. This makes it difficult for students to memorize so many variations of vocabulary. Besides that, the teacher's method of teaching vocabulary is also often ineffective. The teacher only encourages students to frequently read the dictionary and make a vocabulary memorization system. Indeed, by memorizing students can have a lot of new vocabulary, but the vocabulary can be lost within two to three days. Therefore, it can be concluded that different writing and pronunciation system in English, different structure and grammar, and the method used by the teacher that is only instructed students to memorize the vocabulary are the problems faced by the students to master vocabulary.

To solve the problems, a good teacher must use various teaching methods. Teachers can also use English learning applications such as mobile-based learning media. One of the most widely used applications by students around the world is Duolingo. Duolingo is a game-based language learning application.

This is an American educational technology company which produces language-learning apps and provides language certification. On its main app users can practice vocabulary, grammar, and pronunciation using spaced repetition. Based on the survey taken from Duolingo Revenue and Usage Statistics (2022) show a total of 399 million users and it keeps increasing every day. This shows the effectiveness of Duolingo as a trusted platform that is able to increase students' interest, English language skills, one of which is through mastery of vocabulary which is the main aspect in language learning.

Based on the elaboration above, it is interested in conducting a research regarding the use of Duolingo application to teach vocabulary mastery. It is believed that if the students learn using the way they like, there will be an increase in their learning outcomes. This research is aimed at giving answer on the problem 'Does Duolingo improve the vocabulary mastery of the eighth grade students at SMPS Budi Utomo academic year 2022 - 2023?'

Definition of Vocabulary

Thornbury (2002) defined that vocabulary refers to words or terms that have meaning in it. It is used to communicate and understand an idea. Vocabulary is the main element in a language and is a linguistic aspect that must be mastered. Richards (2002) stated that vocabulary is the core component of language proficiency and provides much of the basis for how well learners speak, listen, read, and write. When someone decided to use a particular language, whether it is as a first language or a second language, then that person must have a large vocabulary to assemble it into sentences that can be accepted and understood by the listener or reader, and the same applies if he or she wants to hear or read the statements of others who use the language.

Definition of Vocabulary Mastery

Vocabulary refers to a person's entire amount of words in a certain language. According to Procter (2001) mastery is learning or understanding something and having no difficulty in using it. Therefore, vocabulary mastery is defined as someone's ability to understand and utilize words in a specific language after a learning process.

Definition of Duolingo

Duolingo is a digital platform accessed online for language learning. There are 27 languages available and the most commonly studied and most popular language is English. Duolingo can be accessed through the website or by installing the application on a cellular phone. The application created by Luis von Ahn and Severin Hacker in 2019, is game-based so students will not feel bored and get excited because there is a competition league in it that brings together students who use duolingo from all over the world. White (2014) stated that Duolingo is an online learning program that allows people to take free language courses because they translate.

Relevant Studies

There are several previous studies that have tested the effectiveness of Duolingo to increase and improve students' vocabulary mastery. One of them is conducted by Siregar (2019). The purpose of the study was to discover the improvement of vocabulary mastery using Duolingo which involved 25 of ninth grade students. The findings of this study revealed that using Duolingo game increased students' vocabulary mastery scores. The students that scored 75 or higher on the pre-test were two out of twenty-five (8 percent). In the post-test cycle I, 16 of the 25 students received a score of 75 or higher (64 percent). In the post-test cycle II, the students with scores of 75 or higher were 25 out of 25. (100 percent). Otherwise, the cumulative growing percentage from pre test to post test in cycle two was 100%.

Another study conducted by Ajisoko (2020) involved ten students from Borneo University of Tarakan to explore the use of Duolingo apps in improving student's vocabulary. The study discovered that nearly all learners had significantly higher post-test scores than pre-test scores. The results showed that the learners' scores improved. The mean post-test score is higher than the pre-test score (57.45>79.15), indicating that learners' vocabulary mastery has increased. Learners were more motivated in learning; more skillful because the interest of learning increases.

RESEARCH METHOD

Location and Time

This research was conducted at SMPS Budi Utomo located on Jl. Dusun II Desa Sawit Rejo, Kec. Kutalimbaru, Kab. Deli Serdang, Sumatera Utara and was conducted for a period of time of one and a half months.

Subject of the Research

The subject of this research was the eighth grade students of SMPS Budi Utomo Academic Year 2022 – 2023 which consisted of 41 students. This class was selected to participate based on data showing that its English test results was below the standard KKM.

Research Design

This study used classroom action research design, which used observation data on the process of teaching and learning in the classroom. Action research, according to Carmen quoted from Siregar (2019), is a reflective process that aims to solve a specific teaching learning problem that has been identified. It means that before implementing classroom action research, the researcher must first identify any real-world problems in the classroom.

This research was conducted using research flow refers to the model of Kemmis and Taggart (1988) as described below.

1. **Planning**
   Planning was a step where the teacher arranged learning tools and instruments that used in the research.

2. **Action**
   Action was a step where the teacher applied Duolingo.

3. **Observing**
   Observing was a step where the observation was conducted during the action. The observation was focused on the implementation of Duolingo regarding the students' vocabulary mastery.

4. **Reflecting**
   Reflecting was a step where the researcher and the observer discussed

learning evaluation that conducted in cycle I. The reflection result became a basis for improvement in the next cycle.
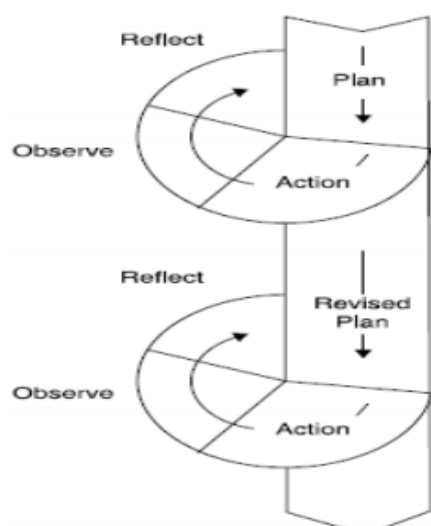
Figure 1. Action Research Spiral, Model from Kemmis and Taggart (1988)

Data and Source of Data

a. Types of Data

There are two types of data sources: primary data and secondary data.

1) Primary Data
   This primary source could be the writer's interview results. Aside from that, the writer conducts field observations and gathers data in the form of notes about the scenario and case surrounding the research item.
2) Secondary Data
   These data are used to support primary data obtained through interviews or direct field observation. Secondary data can include books, other studies, journals, and references that can help in the analyzing process.

b. Source of Data

Data source is the most important factor in determining the data collection method to find out from where the subject of the data is obtained. The subject involved in this study was 41 students of the eighth grade junior high school. The type of data to be studied was the students' vocabulary mastery. The source of the data was obtained from the results of previous students' learning, and by conducting pre-research observations.

Data Collection Technique

Data collection technique is a way of taking data from data sources. There are several data collection techniques in CAR (Class Action Research), and the researcher will apply test, observation, interview and documentation.

Validity and Reliability of the Test.

In this study, to determine the validation of the items and the reliability, the researcher applied the Pearson Product Moment and KR-20 (Kuder Richardson) formulas as follows:

$$rxy = \frac{N(\sum xy) - (\sum x)(y)}{\sqrt{[N(\sum X^2) - (\sum X)^2][N(\sum y^2) - (\sum y)^2]}}$$

Notes :
rxy = the validity of the test
N= the number of students who took the test
X = score of each item
Y = scores of all students items

$$r_{11} = \left(\frac{n}{n-1}\right)\left(\frac{S_t^2 - \sum pq}{S_t^2}\right)$$

Notes :
r11= the reliability of the test
p = proportion of students who answered the item correctly.
q = proportion of students who answered the item incorrectly.
$\sum pq$ = number of multiplication results between p and q.
n = test items
S_t^2 = standard deviation of the test (standard deviation is the root of the variance).

Meanwhile, the variance formula used to calculate reliability is as follows:

$$S_t^2 = \frac{\sum xt^2 - \frac{(\sum xt)^2}{N}}{N}$$

Notes :
S_t^2 = variance, always written in squared form, because the standard deviation is squared.
$(\sum xt)^2$ = square of the number of scores obtained by students.
$\sum xt^2$ = sum of the squared scores obtained by students.
N = the number of students who took the test

According to Arikunto (2012) the reliability of test can be categorized as follows:
0.00 – 0.20 = the reliability is very low
0.21 – 0.40 = the reliability is low
0.41 – 0.60 = the reliability is fair
0.61 – 0.80 = the reliability is high
0.80 – above = the reliability is very high

In conducting the test validation, 25 questions were given to 24 students of the eighth grade at Yayasan Perguruan Rakyat Sei Glugur. The results of the scores obtained by students showed that there were 5 invalid questions out of 25 questions. The results were calculated by using correlation formula from Microsoft Excel application.

Technique of Data Analysis

There were two ways in analyzing the data at the end of meeting in each cycle.
1. Descriptive Technique

   During the teaching and learning process, the descriptive technique was used to determine students' behavior. Descriptive technique was used to analyze the observation and the interview sheet created previously to obtain qualitative data.

2. Statistical Technique
   Statistical technique was used to determine whether the use of the Duolingo application has an effect on students' vocabulary mastery or not, as seen in the results of the students' orientation test and post – test.
   Orientation test and post - test are quantitative data needed to determine whether a student's score is improving. The evaluation is based on a rating scale from 1 to 100 and the final results are calculated according to the following formula:

$$S = \frac{R}{N} \times 100$$

Notes :
S = score of the test
R = the number of correct answer
N = the number of questions

To categorize the students obtained 75 is calculated by applying the following formula :

$$P = \frac{R}{T} \times 100\%$$

Notes :
P = the percentage of students obtained point up to 75
R = the number of students obtained point up to 75
T = the total number of the students who took the test

To find out the mean of the students' score for each cycle, the mean of student's score are calculated in order to know the categories of student's ability. The N-Gain Score is a standard score in the form of a person's score from the mean of the group by orientation test and post test. Design in the Standard Deviation unit the researcher applied the below formula:

$$X = \frac{\sum x}{N}$$

Notes :
X = the mean of students' score
$\sum x$ = the total score
N = the number of the students

Research Procedures

In CAR, the research design is carried out in cycle form. Cycles in CAR should be made in a minimum two cycles. Each cycle includes: planning, implementation, observation, and reflection.

FINDINGS AND DISCUSSIONS

A. Data Analysis

Quantitative and qualitative data were used to analyze the data. The quantitative data were derived from the mean of the students' vocabulary test scores. The qualitative data were gathered through interviews, observation sheets, and documentation.

This study was completed in two cycles and each cycle consisted of four steps (planning, acting, observing, and reflecting). The first cycle was conducted within four meetings, including orientation test. The second cycle was implemented three meetings.
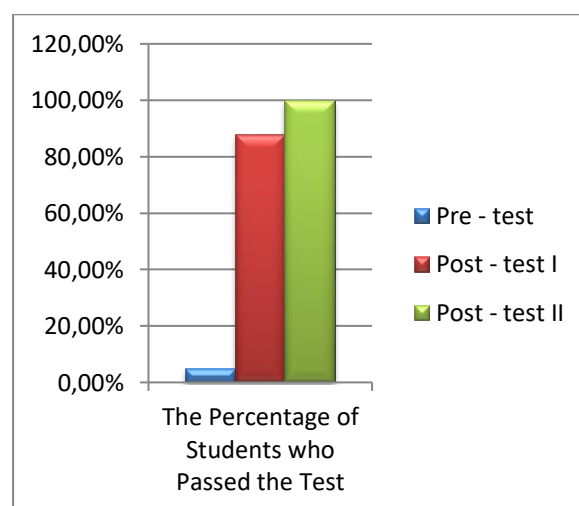
1. The Quantitative Data

The quantitative data were obtained from the results of students' vocabulary mastery tests after using Duolingo for three meetings. Orientation test was given at the first meeting and post - test was given at the end of each cycle. Before using Duolingo, it can be seen that the students' vocabulary mastery are still very low through the orientation test results.

The percentage below showed a significant improvement of students' scores from the orientation test, post-test I and post-test II. In the orientation test, there were only 2 students (4.9%) who got score of 75 and above out of 41 students, whereas in the post – test cycle I there were 36 students (87.8%) who scored 75 and above out of 41 students. In the post – test cycle II, all 41 students (100%) scored 75 or more.

The comparison of students' mean scores in the orientation test, post – test cycle I and post – test cycle II, and the comparison of students achieved KKM scores in the orientation test, post – test cycle I and post – test cycle II can be seen in the following graph :
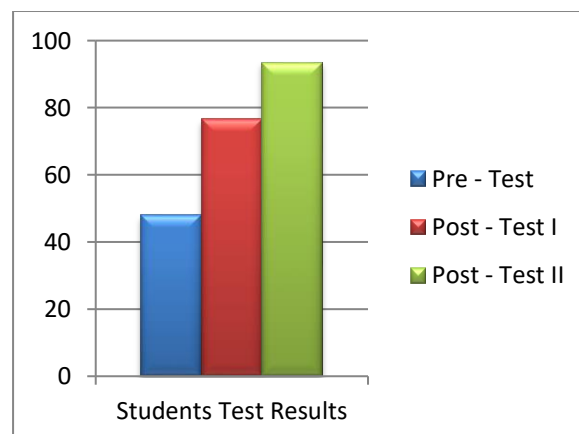
Graph 1. Students' Test Results

Graph 2. The Percentage of Students Who Passed the Test

2. The Qualitative Data

The qualitative data in this study were obtained from observation sheets, interviews with students and the teacher of English subject also from documentation.

a. Observation Sheet

The observer observed the attitudes of students, the problems faced and the attitudes of researcher as well as the way researcher built a conducive and enjoyable learning atmosphere. The results of the observation provided additional information about students' attitudes, teacher's attitudes, class conditions, students' participation and their interactions with fellow students and students' interaction with the teacher. The results of the observation

found out that students were more enthusiastic in learning English when using Duolingo.

b. Interview

Interviews were conducted in two sessions. The first session was conducted before the application of Duolingo which was concerning about the students' difficulties in mastering vocabulary. In the interview session, one of the difficulties they found in English lessons was the difficulty in mastering vocabulary. In addition to the many variations of vocabulary, they must also be able to adapt the vocabulary to the context of the usage. Moreover, the class facilities are inadequate, causing the learning process tends to be boring. Interview was also conducted for English teacher to find out what challenges the teacher faces in teaching English and classroom conditions during English lessons, the methods used, and how the analysis of the Duolingo application and its effect on students' vocabulary mastery. The second session was conducted after applying Duolingo to find out students' reponses after using the Duolingo application to improve their mastery of English vocabulary.

The results of the interviews after using Duolingo showed that students became more active in learning. They were more engaged in the learning process. With a variety of questions and interesting visual and audio, they discussed with each other and reminded each other if there are other students who do not know some vocabulary at the beginning of using Duolingo.

The classroom atmosphere which was usually noisy because of students were busy teasing each other, now became noisy because of the audio from the Duolingo Application and students focused on their own screens.

The results of interview with teacher after the use of Duolingo also showed positive results because the teacher also felt that students enjoyed the learning process. Teacher can also use Duolingo application as a reference in making

practice questions because Duolingo application not only can be used to improve students' vocabulary mastery, but also can help students practice speaking and listening, and practice translating sentences.

c. Documentation

Photos are one form of documentation as evidence of students and teacher activities in the classroom. The photos taken including important information about the activities students do in the classroom, such as when the students engaged in doing orientation test, applying Duolingo application, and completing post – test. The photography revealed that the students were engaged and attempted to complete the tasks assigned to them in a supportive manner based on their abilities

B. Discussion

This study was carried out by implementing CAR design to improve students' vocabulary mastery through the use of the Duolingo, as one of the application that can be used to teach vocabulary. According to the findings, Duolingo is an effective media to teach vocabulary. This is supported by the analysis of the research data which shows the increasing mean score in each cycle. The mean score for the first cycle was 76.58, and the mean score for the second cycle was 93.5. It was discovered that the second cycle's score and mean were higher than the first cycle's. The percentage of students who obtained score 75 or higher increased as well. In the cycle I test, 36 out of 41 students obtained score 75 or higher. The students who obtained score 75 and higher were 41 out of 41 students in the second cycle. The students has been improving since the first meeting.

Based on the qualitative data obtained from the observation sheet, interview, and documentation, all of these instruments indicated an improvement in the teaching learning process. As the result, the students responded well in class. The results of qualitative and quantitative data showed that the action and implementation of Duolingo improved. When the teacher taught the lesson, the students were engaged and focused.

Based on the findings, Duolingo could help students improve their vocabulary mastery. Duolingo could also motivate students to participate in language learning by allowing them to participate in the teaching and learning process. Despite the fact that the researcher discovered that the students did not pay attention to the teacher seriously during the first and second meetings, some of them talked loudly and teased each other. It cannot be denied that the students require more attention from the teacher in order to maintain their motivation. Aside from that, their desire to learn vocabulary remained low. As a result, it is the teacher's responsibility to find some sources that will motivate them to learn the vocabulary.

From the researcher's analysis, the application of Duolingo in this study showed its effectiveness because it initiates interactive learning and fully engages students by presenting visuals and sounds that come from the students' everyday environment, so that students can easily learn and absorb information from Duolingo. Interactive learning with interesting media makes students feel happy and really enjoy the learning process in mastering vocabulary. Everyday they kept asking were they going to use Duolingo tomorrow or not. Even at the end of the meeting, they asked if they could use Duolingo again, and hoped that the use of this application would not only be limited to research purposes.

CONCLUSION AND SUGGESTIONS

Conclusion

Based on the findings of the study, it is concluded that teaching vocabulary through Duolingo definitely can improve students' vocabulary mastery. The students' ability in learning vocabulary is not bad, but they need more challenging and enjoying activity and creativity in learning vocabulary, so that their motivation to master vocabulary continues to increase. Thus, the findings of this study concluded that there was students' improvement in learning vocabulary after using Duolingo.

Suggestions

1. For the English teacher

Duolingo is one of the interesting learning media, easily accessible, with an attractive

visual so that students do not feel bored and are able to improve students' vocabulary mastery. Thus, it is highly recommend the use of Duolingo to increase students' motivation and scores. However, the use of learning applications must continue to be under the supervision of the teacher so that there is no misuse of learning media.

2. For other researchers

For other researchers with the same interesting in students' vocabulary skills and appropriate media to help students' vocabulary development through the use of Duolingo.

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