



## The Use of Augmented Reality Flashcard in Enriching Students' vocabulary

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**Abstrak.** Tujuan dari penelitian ini adalah untuk mengetahui apakah penggunaan Media Augmented Reality Flashcard dapat memperkaya kosakata siswa. Penelitian ini merupakan pra-eksperimen dengan populasi siswa RA. Perwanida 1 Lipu tahun akademik 2020/2021 dengan total populasi 64 siswa. Sampel penelitian ini adalah kelompok 1 dari kelas B RA Perwanida 1 Lipu yang berjumlah 22 orang. Instrumen yang digunakan dalam penelitian ini adalah tes kosakata dengan cara pemberian tes awal dan tes akhir dalam bentuk tes objektif yaitu pilihan ganda. Penelitian ini menggunakan statistik deskriptif untuk menganalisis data. Statistik deskriptif yang digunakan dalam penelitian ini meliputi penjumlahan, rata-rata, standar deviasi, dan tabel frekuensi. Hasil penelitian ini menunjukkan bahwa penggunaan media ajar Augmented Reality memberi dampak positif dalam menambah kosakata siswa. Hal tersebut terbukti dari adanya peningkatan nilai siswa dari tes awal hingga tes akhir dengan nilai rata-rata saat tes awal adalah 3,02 dan nilai rata-rata setelah tes akhir adalah 6,02. Jadi, dapat disimpulkan bahwa media Augmented Reality flashcard berpengaruh dalam meningkatkan kosakata siswa.

**Abstract.** The objective of the research is to find out whether or not the Augmented Reality Flashcard can enrich the young learners' vocabulary. This study is a pre-experimental study with a population of RA. Perwanida 1 Lipu for the 2020/2021 academic year, with a total population of 64 young learners. The sample of this study was group 1 from class B RA Perwanida 1 Lipu, consists of 22 young learners. The instrument used in this study was a vocabulary test. The researcher was giving a pre-test and post-test in the form of an objective test, namely multiple choice. This research used descriptive statistics to analyze the data. Descriptive statistics used in this research include summation, average, standard deviation, and frequency table. The results of this study indicate that the use of Augmented Reality teaching media has a positive impact on enriching students' vocabulary. It was proven from the increase in student scores from the pre-test to the post-test with the average value during the pre-test was 3.02 and the average value after the post-test was 6.02. So, it can be concluded that Augmented Reality flashcard media has an effect in increasing the students' vocabulary.



## Introduction

Education is the process of changing the attitudes and behavior of a person or group of people to mature humans through teaching and training efforts. Meanwhile, according to Anwar (2014), education is an important part of life, simultaneously differentiating humans from other creatures. human learning means a series of activities towards maturity to lead a more meaningful life. So, education is a human effort to improve the knowledge obtained from both formal and informal institutions in helping the transformation process so that it can achieve the expected quality.

In a broad sense, education includes all the actions and efforts of the older generation to transfer their knowledge, experience, and skills to the younger generation to prepare them to fulfill their life functions physically and spiritually. That is, education is a deliberate attempt by adults to (with its influence) increase the child to maturity which is always interpreted as being able to create moral responsibility for all actions (Astuti et al., 2020; Tobar-Muñoz et al., 2017).

According to Kustanti, et al (2017), English is the official language of many Commonwealth countries and is widely understood and used. English is spoken in more countries in the world than any other language and compared to other languages except Chinese. This language is the language of the world that has the most speakers. Thus, if you can speak English, it will increase future opportunities to compete for a better life.

When we learn a language, especially English, we have to know and understand some important things, they are language skills and components. There are 4 skills: speaking, reading, writing, and listening. speaking and writing as productive skills while reading and listening as Receptive skills. Not only skills, in English there are also 3 language components that should be known

such as grammar, vocabulary, and pronunciation

In this research, the researcher focuses on vocabulary. Vocabulary is a collection of words that are owned by a language and gives meaning when we use that language. In general, the distribution of vocabulary is divided into 4 major groups, namely the Noun Group, the Verb Group, the Adjective Group, and the Adverb Group. Besides that, other word groups are known, namely Pronouns, Articles, Prepositions, and Conjunctions.

The researcher conducted preliminary research on April, 10<sup>th</sup> 2021. The researcher found that students were lack of vocabulary. It was proved by the result of the teacher interview. It is because the teacher has no English competencies. The teacher also had no idea or creativity for the media that they use in teaching (Zainuddin et al., 2016).

From the results of preliminary research on the teaching and learning process, the teacher currently uses textbooks or things around the classroom and school. The use of provided pictures in textbooks makes students tend to be passive and less interactive because the picture as media is unable to provide a reciprocal response, less tangible, and less attractive. Supporting the subject matter requires learning media that is more interactive and attractive to students.

To overcome the problem, the researcher tends to use innovative, attractive, and interesting media. One of the media that can be used to make students interested to study is Augmented Reality media. The use of Augmented reality applications can be used as a teaching aid in learning (Chen et al., 2019). Augmented reality technology-based teaching aids are very useful in improving the teaching and learning process because augmented reality technology has entertainment aspects that can arouse students' interest in a concrete understanding of the material conveyed

through three-dimensional visual representations by involving user interaction in an augmented reality frame.

The researcher used some Augmented reality flashcard that presents a virtual picture with 3D animal objects. So that, 3D animal objects will be able to appear on Android smartphones. The Animal 4D application can be more informative because it provides a menu display and guides in using it, as well as

conveying animal names, and animal sounds, and explaining information about these animals to young learners in English (Punar Özçelik et al, 2022;). Based on the description above, the researcher decides to conduct research entitled "The Use of Augmented Reality Flashcard in Enriching Students' vocabulary.

## Research Method

The researcher used a pre-experimental design which is a one-group pretest-posttest. The variables of the research were distinguished into 2 kinds namely Augmented reality flashcard as independent variable and the enrichment of young learners' vocabulary as dependent variable. In this research, the design used a one-group pretest-posttest. It can be described as follows:

*Picture 1. Design one-group pre-test-post-test*

O1 = Pretest Score

X = Treatment

O2 = Posttest Score

O1 x O2

The population is class B of RA. Perwanida 1 Lipu in Academic Year 2020/2021 consists of 3 groups. Group 1 consists of 22 students, group 2 consists of 21 students, and group 3 consist of 21 students, so the total population is 64 young learners in RA. Perwanida 1 Lipu. The sample of this research used cluster random sampling technique, and the sample is group 1, that consist of 22 young learners.

The researcher used a vocabulary test, and the test was given by giving pre-test and post-test. The test intends to indicate the young learner's enrichment in vocabulary. The test used in this research is a test that aims to measure young learners' enrichment in vocabulary. The type of test used in this research is an objective test. The test is in the form of multiple choice, which amounts to 30 questions. This question is in the form of an image with four options.

The researcher collected the data by covering the administration of pre-test and post-test in the following procedure: The researcher gave a multiple-choice test which consists of 30 items in the form of pictures to each young learner. Because the samples are young learners who cannot read, the researcher helped young learners by reading the questions. After the researcher shows the picture, young learners can mention the vocabulary of that picture, then the correct answer will get 1 point, while the wrong one will get 0 points.

The researcher summed up how many correct answers each young learner had. Then, the researcher multiplied it to get the final scores.

This research used descriptive statistics to analyze the data. Descriptive statistics used in this research include summation, average, standard deviation, and frequency table. The following are the techniques used to analyze the data that has been collected:

- Tabulation of student test scores after treatment in the pre-experimental class.
- Calculate the mean score of the students' test by using SPSS.
- Classifying the score of the students into five levels
- Calculate the value of the T-test. Calculating the value of T-test to find out the significant difference between the pre-test and post-test by using SPSS.

## Results and Discussion

### A. Results

This section deals with the presentation of the pre-test and post-test data. Before treatment, students were given a pre-test to determine their vocabulary level. In addition, the purpose of the test is to find out whether before and after treatment students have progressed in enriching their vocabulary. Then the same test was conducted to measure whether students made progress in vocabulary achievement through the use of the augmented reality flashcard. To analyze the data obtained from the test, the researcher applied the t-test analysis in SPSS.

As mentioned above, the researcher used a pre-test, treatment, and post-test in collecting the data. The following is a description of each activity.

#### 1. The data analysis of the Pre-Test

Before giving the pre-test, the researcher gave little explanation of vocabulary about the various animals and showed some examples. Before teaching and learning activities are carried out, the researcher conducted pre-tests that were attended by 22 students and provided 30 multiple-choice items as their pre-test.

After examining the results of the students' pre-tests, the researcher concluded that the student's vocabulary was severely lacking. The result of the pre-test can be seen in table 1 below.

**Table 1.** *The Result of Pretest*

No	Classification	Score	Frequency	Percentage
1.	Excellent	9.6-10	0	0%
2.	Very good	8.6-9.5	0	0%
3.	Good	7.6-8.5	0	0%
4.	Fairly good	6.6-7.5	1	5%
5.	Fair	5.6-7.5	0	0%
6.	Poor	3.6-5.5	4	18%
7.	Very poor	0.0-3.5	17	77%
Total			22	100%
Mean Score			3,02	

The table above shows that students' scores in vocabulary tests are very poor. From 22 students who took the test, 1 student (5%) scored fairly good, 4 students (18%) scored poor, and 17 students (77%) scored very poor.

The average test score is 3.02. It means that the student's vocabulary was very low. Therefore, the researcher is trying to apply augmented reality flashcard animal 4D+ in teaching vocabulary as a media to enrich students' vocabulary.

#### 2. Treatment

After the researcher obtained the pre-test score, students proceeded to the next step. This step was divided into 4 (four) meetings. At the first meeting, the researcher as teacher

focused on getting to know the alphabet and the various animals on the flashcard. Then, the teacher focused on memorizing animals' names that had been studied in the previous meeting. The teacher began to involve students to practice the use of augmented reality in a limited way due to limited time. At the third meeting, the teacher focused on recalling the kinds of animals that they have learned previously. The students were asked to pronounce animals' name that have been shown one by one. Finally, at the last meeting, the teacher explained the animal features, food and sounds. The students learned not only the name of the animals but they learn the characteristics as well.

### 3. Analysis of Post-test

After giving treatment, the researcher gave a post-test. The post-test aims to measure the

students' vocabulary achievement. The result of post-test can be seen in the table 2 below

**Table 2.** *The Result of Post Test*

No	Classification	Score	Frequency	Percentage
1.	Excellent	9.6-10	0	0%
2.	Very good	8.6-9.5	0	0%
3.	Good	7.6-8.5	2	9%
4.	Fairly good	6.6-7.5	3	14%
5.	Fair	5.6-7.5	11	50%
6.	Poor	3.6-5.5	6	27%
7.	Very poor	0.0-3.5	0	0%
Total			22	100%
Mean			6,02	

The table above shows that students' scores in vocabulary tests are fair. Of the 22 students who took the test, 2 students (9%) scored Good, 3 students (13,64%) scored Fairly Good, 11 students (50%) scored Fair, and 6 students (27,27%) scored Poor.

The table above shows the mean score of post-tests after treatment. The posttest average score is 6.02 which is categorized as fair, while the table.2 average pretest score before treatment is 3.02 which is case vocabulary prized as very poor. This shows that after being given treatment, the average score is higher. This proves that the treatment with augmented reality flashcards provides a significant increase in enriching students' vocabulary.

### 4. The data analysis of vocabulary test.

The statistical summary of the students' pretest and posttest. After calculating the result of students' pre-test and post-test scores. The statistical summary shows that the total number of subjects is 22 students. The pretest scores increased significantly. As the result, the mean scores in the pretest are classified as poor classification, while in the posttest the mean scores are classified as fair classification.

Thus, the mean score in the pretest was 3,02 and in the posttest was 6,02. It indicated that the mean score of students' vocabulary achievement in the post-test was higher than the pre-test.

**Table 3.** *The T-test of the students' vocabulary*

Variable	T-value	T-table	Description
Pretest and posttest	13.215	2.0796	Significantly different

Based on the statistics T-test shown above, it can be concluded that the probability value is smaller than the level of significance ( $13.215 > -2.0796$ ). It means that  $H_1$  was accepted and  $H_0$  was rejected. It can be inferred that there is a significant difference before treatment in the pre-test and after treatment in the post-test. In other words, there was significant enrichment in students' vocabulary between the pretest and posttest. Then, the key is that augmented reality Flashcards can make a significantly greater contribution to students' vocabulary.

## B. Discussion

In the discussion section, the researcher will discuss the findings from the data collection, some theories, and the interpretation of the test results. Next, the researcher introduced a description of the data obtained from the pre-test and post-test after treatment using augmented reality media. which can make students enjoy the learning process, students can also open their minds to mention or pronounce the vocabulary given by using pictures

(Binhomran et al., 2021). Students easily remember words using real pictures rather than just giving them a list of words.

English in Indonesia is designated as a foreign language. but has a very important influence on students. This is evidenced by the fact that English is set as a compulsory subject in schools and even tested in national exams (Aydogdu et al., 2021). Teaching and learning English in educational institutions (especially formal education) is the most important factor that makes English the main foreign language in Indonesia. Most of the students lack English vocabulary. Teachers need interesting media in introducing new English vocabulary to students. Therefore, in this study, the researcher used augmented reality media in teaching vocabulary.

In addition, several studies have shown that textbook visualization can be more effective in enriching the students' conceptual understanding, than simply summarizing information in textbook chapters. Robinson and Kiewra in McDermott (2010) learning vocabulary means learning information or meanings that will just be known. The use of augmented reality in learning and teaching vocabulary facilitates the transmission of vocabulary information and is easy for students to understand. Robinson and Kiewra in McDermott (2010) stated that using infographics such as tables, charts, and other visual elements is an effective way to convey new information to students.

The use of Augmented Reality in learning vocabulary can facilitate the students in learning English. Syamsinar (2022) states that Augmented Reality as a learning medium can improve the students' interest in learning because it combines the virtual world that can increase children's imagination with the real world directly. In this research, the researcher used Augmented reality flashcards as visual aid aids that contained three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects derived from

sensory images of flashcard animals. Visual aids are a better medium for teaching vocabulary to students. It is in line with Carminignaniani and Furht in Saputri et al. (2020) Augmented Reality is a technology that combines virtual objects or images into a real environment in real-time.

Based on the opinions of the experts above, it can be concluded that picture media is a form of realization of two-dimensional visual media, which imitates objects and views through a combination of words and ideas that are fast, clear, and strong but impractical, concerning the above statement it can be said that picture media does not so influential on students to absorb what will be conveyed in the picture. Therefore, Fitriyani & Nulanda (2017) supports it by explaining that media is a necessary tool for learning English, especially for young learners. Teaching and learning English activities for students should be accompanied by the use of media, especially visuals. Based on the results of the study after treatment, the student's English vocabulary showed good results.

It is reflected in the increase in students' post-test scores after treatment. Although some students got lower scores, the average score of students was categorized as fair. Although there are still some students who get scores that are classified as lower, the average score of students can be categorized as quite increasing by looking at the differences in the results of the students' pre-test and post-test. The difference in children's English vocabulary mastery before and after receiving the augmented reality media treatment shows that the enrichment of children's English vocabulary through this media is very influential (Jalaluddin et al., 2020).

It can be proved by the average pre-test before treatment was 3.02, while the students' scores after treatment showed an increasing trend, with an average score was 6.02. These data indicate that students have different scores on the pre and post-test. It indicates that there is a significant difference between

the average pre-test and post-test scores after treatment. It means that the use of augmented reality media can enrich students' vocabulary (Kayaduman et al., 2023).

Learning media that used 2D media in the form of images also have objects and characters but do not have shadows and also colors in monotonous images so that students can see from one side only. While the media in the form of videos or objects that are 3D is an extension of 2D with excess volume and has a shadow that makes students more interactive in using it as a learning medium whose results look alive so that 3D media is certainly more attractive to students because it looks alive. It is in line the opinion of Saputri (2017) who explain that 4D augmented reality is a combination of virtual worlds and reality created by technology. Virtual objects can be text, animation, 3D models, or videos that blend into the real environment so that users can feel that the virtual object is in their environment, which makes students feel easier in the learning process because students will feel more real and feel closer.

In teaching and learning process, the teachers cannot always provide concrete animals for vocabulary learning, because not all animals are in the school environment. It will help the teacher to introduce various kinds of animals. Not all things can be learned directly, so many things can be learned by using imitation objects. Augmented Reality

media helps students to identify the animals because it can be rotated in various directions to see different sides of the animal (Liao et al., 2023)

The use 4D+ media are more attractive by presenting visualizations and animations of models or object designs that describe the virtual world of a combination of 2D and 3D in the real world of 4D+. The Augmented Reality flashcard supported by the sound of the animal so that students can listen and then repeat the name of the animal that is mentioned from the application 4D+. With they are learning using augmented reality 4D+ which has a multisensory learning model. Multisensory learning is a learning process that involves all the senses so that students can understand learning easily. Beside that, Abidin (2014) explains the nature of multisensory learning is learning that is carried out by involving various stimulations in line with hearing, sight, touch, and also smell, and taste. Through this learning model, it is hoped that the process of acquiring information does not only come from sources but various sources, because this learning is different from learning that usually only uses one sense, for example, hearing.

Comparing the results of the pre-test and post-test, the researcher found that the use of augmented reality flashcards in teaching vocabulary was effective. It was proved by the mean score of the post-test.

## **Conclusion**

Based on the results of this research, which was conducted, Including pre-test, treatment, and post-test. So, it is clear that the use of augmented reality media can enrich students' vocabulary. Students' pre-test scores were low before the treatment. Contrary to the post-test scores of students after treatment. It showed on students' post-test scores. The score is higher than the pre-test score. The researcher can conclude that the use of augmented reality media in learning

activities has positive results and contributes to the enrichment of students' vocabulary.

The application of augmented reality-based media in learning animal vocabulary has a positive impact on students in enriching animal vocabulary, making it easier to remember vocabulary, making it easier to pronounce vocabulary, and being able to attract the students' attention in the teaching and learning process carried out in class.



Based on the treatment during 4 meetings conducted in class, the researcher assessed that most students feel happy and more interactive in using this media, and can help them in enriching vocabulary, making it easier to pronounce English vocabulary not feel sleepy during the teaching and learning process, and increasing interaction with teachers and other students.

It was supported by significantly different results, namely the average score of students from the pre-test results 3.02 to 6.02 in the post-test. It can be categorized as a positive contribution from students. Thus, augmented reality media can enrich students' vocabulary by looking at the average results of the pre-test and post-test.

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