

## **Augmented Reality in 4D Flashcard: The Effects in Teaching Speaking Skill**

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### **Abstract**

The purpose of this study was to determine whether the use of augmented reality in 4D flashcard can improve students' speaking skills. This study used a pre-experimental method with one group pre-test and post-test design. The sample of this study was Class XI MIPA 3 consisting of 34 people with classroom random sampling techniques. This research instrument was a test of speaking skills. The results of this study showed that there was an increase in the students' average score. The pre-test score of students (55.37) is greater than the post-test (71.03). In the significance level p (5%) and T-test value of 2.03 is greater than T-table 16.46 ( $2.03 > 16.46$ ). Thus, it can be concluded that the use of augmented reality of 4D flashcard students were able to improve students' speaking skills. So, the null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_a$ ) is accepted.

### **Keywords**

Augmented Reality, 4D flashcard, Speaking Skill

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## **INTRODUCTION**

Technology is a supporting tool used in education to make it easier for teachers to teach students with the results to be achieved. In times like today we often encounter the use of technology in the implementation of learning carried out by an educator to teach students to learn (Budiarso, 2004). One of the technology-based learning media that can be used in the learning process, especially learning English, is the use of media.

English acts as a global or world language because English is learned and used as a means of communication in various countries both as a first language, a second language, and as a foreign language (Sardi et al, 2017). By having the ability to speak English, we can easily access and obtain information because most of the information is written in English. In essence learning English is learning to communicate, therefore in the process of learning English students are directed to improve their ability to communicate both orally and in writing. One of the abilities that need to be used to help improve students' ability to communicate using English is speaking skill.

Speaking Skill is a functional oral language skill in everyday human life. Why not because by speaking we can obtain and convey information. According to Tarigan (1990: 8) Talking is a way to communicate that influences our daily lives. Speaking skills must often be trained or practiced so that they can improve, besides that good speaking skills will make it easier for students to communicate using English (Sahrawi, 2021).

To learn to improve speaking skills is not to learn to improve speaking skills is not something easy but requires the right and fun way and attracts the attention of students so that it is easier to understand and digest (Rahmaniar et al, 2024). The learning process in the field of English-speaking skills requires the right strategy to grow and develop students' interest in improving English speaking skills as well as possible. something easy but requires the right and fun way and attracts the attention of students so that it is easier to understand and digest. The learning process in the field of English-speaking skills requires the right strategy to grow and develop students' interest in improving English speaking skills as well as possible.

Speaking skills require careful preparation by both the teacher and supervisor. To overcome this problem, both teachers and supervisors can prepare or use learning media so that it is easier for students to develop interest and enthusiasm in learning speaking skills (Sardi et al, 2022). One of the learning media that needs to be used to improve students' speaking skills is learning media based on Augmented Reality technology in 4D Flashcards.

Augmented Reality (AR) is a media development process that uses the Android operating system and uses flashcards with pictures so that the learning process provides an interesting and different atmosphere (Dewi et al, 2021). Through Augmented Reality technology, information can be inserted into the virtual world and displayed in the real world with the help of gadgets such as webcams, computers and mobile phones.

The application of Augmented Reality in the world of education because it can combine real and virtual situations that are used to overcome problems in understanding the lessons delivered (Idrus et al, 2022), therefore in learning English especially in the aspect of speaking ability, it is necessary to develop in Augmented Reality technology-based learning media to improve speaking skills student. The use of Augmented Reality technology is very useful in improving the teaching and learning process, because Augmented Reality technology has entertainment aspects that can arouse students' interest to understand concretely the material presented through 3D or 4D visual representations (Fitriyani et al, 2017).

4D Flashcard is a learning media developed using augmented reality (AR) technology or known in Indonesian as augmented reality. 4D flashcard can be said to be a new product from Octaland Studio which shows 3D or 4D images using special paper and cellphones. As a result, it can produce a real picture so that the use of 4D flashcard media in the learning process will be very fun and attract the attention of students. 4D flashcards include alternative media that can be expected to help improve students' abilities, especially improving speaking skills.

Based on the results of observations made by researchers, English skills at SMAN 7 Pinrang are still low, especially in terms of speaking, so researchers will improve students' speaking skills by using Augmented Reality in 4D flashcards as an innovation and also attract students' attention in learning English. In this case, the researcher extends to find out the effect of using augmented reality media in 4D applications in teaching second grade students at SMAN 7 Pinrang.

## **LITERATURE REVIEW**

Using a foreign language socially tends to be natural. Although the use of pedagogical foreign languages is usually artificial, because international teachers organize several class activities that aim to stimulate students' spoken products (speak up). In class, students can produce several types of performance in speaking skills during class activities to promote communicative competence. According to Brown, there were five types of speaking categories that students may carry out in the classroom, as follows:

**Imitative Speaking;** At one end of a continuum of types of speaking performance is the ability to simply parrot back (imitate) a word or phrase or possibly a sentence. While this purely phonetic level of oral production, a number of prosodic, lexical, and grammatical properties of language may be included in the criterion performance. This type of speaking activity is the ability of students to imitate or repeat what they hear such as words, sentences, even conversations with the correct pronunciation. It is said that this kind of imitation is done not for the purpose of meaningful interaction, but to focus on spoken or repeated utterances (Ginting et al, 2017).

**Intensive Speaking;** Intensive speaking is a type of speaking that emphasizes students' linguistic abilities such as mastery of grammar, phonology such as intonation. Intensive speaking requires students to produce spoken language that shows grammar, phrases, and lexical language. activities such as reading aloud which assesses intonation, stress patterns, and rhythm. tests grammar skills (longer than imitative). Examples of task-intensive assessment include guided tugs, reading aloud, sentence and dialogue completion, limited image-cued tasks including simple sequences, and translation down to the simple sentence level.

**Responsive Speaking;** Responsive Speaking is a type of speaking that emphasizes the ability of students to speak English spontaneously, such as asking and answering briefly. This type emphasizes the authenticity of the activities carried out where it is related to real life. In addition, responsive assessment tasks include interaction and understanding tests but to a somewhat limited degree, standard greetings and small talk, simple requests, comments, and the like.

**Interactive Speaking;** So between responsive speaking and interactive speaking the difference is the length of the conversation and the number of participants involved in a conversation where interactive speaking involves more participants who enliven the conversation and the conversation is more complex. For example, transactional conversations (carried out with the aim of getting information as in the conversation

examples A and B) and interpersonal (carried out with the aim of socializing such as greetings).

Extensive Speaking (Monologue); Broad spoken production tasks include speech, oral representation, and storytelling, in which opportunities for spoken interaction from listeners are severely limited (possibly for nonverbal responses) or ruled out altogether. In this type of speaking students are required to give speeches, oral presentations, or tell stories. Besides that, speaking extensively is very important, students are left alone to produce clear and understandable speech (Wahyuni, 2022).

In this study, the writer selected intensive speaking as the basis for carrying out the learning process, because this type of speaking emphasizes the linguistic abilities of students such as mastery of grammar, phonology such as intonation, stress, rhythm. Intensive speaking requires students to produce spoken language that shows grammar, phrases, and lexical. Test basic grammar skills, pronunciation and so on.

Augmented reality is a technology that combines two or three-dimensional virtual objects and then projects these virtual objects in real time. In addition, augmented reality belongs to a new branch of technology however, the development was very fast. Over time, this technology is used in various fields, especially in the military and advertising. And now, starting to apply in the field of education (James R. Valino, 1998).

Augmented Reality (AR) can be defined as a technology that is able to combine virtual objects in two dimensions or three dimensions into a real environment and then display or project them in real time (Hamzah et al, 2017). Augmented Reality (AR) allows its users to see the real world with computer generated virtual objects superimposed on the real world. Augmented Reality can be used to help visualize abstract concepts for the understanding and structure of an object model. Currently Augmented Reality is widely used in the fields of games, medicine, and image processing, while in the field of education it is still rarely used. Sutherland is a researcher who has developed a variety of devices where users can see, hear and touch objects in the virtual world, ranging from imaginative simulations to technologies that increase user interaction with the virtual world and the real world. The function of Augmented Reality is to increase understanding of the surrounding environment and partially make virtual and real environments a new interface and display relevant information (Nuriana, 2016).

## **RESEARCH METHOD**

This research is quantitative design. The method used pre-experimental method with one group pre-test and post-test design (Gay et al., 2006). The research conducted at SMA 7 Pinrang which is located on Jl. Poros Pinrang Pare, Kec. Mattiro Bulu, Kab. Pinrang, South Sulawesi Province. In this study, researchers would spend one month more including analysing data. The population of this research was the second grade students at SMAN 7 Pinrang with ninety six students.

The sample is part of the number and characteristics possess by the population (Siyoto & Sodik, 2015). If the population is large, and it is impossible for the researcher to study everything in the population, then the researcher can use samples taken from that population. In this study the sampling technique used classroom random sampling. The researcher used a classroom random sampling technique because all students were distributed fairly to all classes, both in terms of gender and cognitive abilities. In this study, the sample was class XI MIPA 3. This class consisted of students, 17 male and 17 female.

The procedure of collecting data in this research, as following The Pre-test was given before giving the treatment. The researcher would given a 4D flashcard, then the students must explain the picture using their own words. The researcher will find out the students speaking skills in the pre-test which is given directly before treatment. After treatment, the researcher gives a post-test to students to improve students' speaking skills. In this post-test, the researcher will provide the same picture at the pre-test stage. The students would explain the 4D flashcards, using their own words. Then the researcher would find out the increase in students' speaking skills in the post-test. However, the technique of data analysis used is score classification in order o find out students' speaking ability, it would view four components, and they were vocabulary, comprehension, fluency, and pronunciation (Brown, 2008).

## FINDINGS AND DISCUSSION

The findings of this research consist of the classification students pre-test and post-test. Pre test was given before treatment to know students speaking skill then post-test was given to know students speaking skill after doing treatment. From the results of the post-test, aims to find out that the use of augmented reality in 4D flashcard able to improve the speaking skills of students in Class XI MIPA 2 in SMAN 7 Pinrang.

This section describes the results of data analysis using augmented reality in 4D flashcards for second grade students at SMAN 7 Pinrang.

### a. The Students Score in Pre-test

The researcher gave 4D flashcards to the students as a pre-test to find out the students' speaking ability. Then, students have to explain the pictures on the 4D flashcard using their own words. After giving the pre-test to students, the researcher found out the results of students' speaking skills based on the criteria for speaking skills, namely vocabulary, comprehension, fluency and pronunciation before giving treatment. The results are shown in the following table:

**Table 1. The Students Score in Pre-test Based on Speaking Skill**

No	Name	Voc.	Comp.	Flue.	Pron.	Score	Konv.	Classification
1	AZ	6	5	5	6	22	55	Poor
2	AMP	6	5	7	6	24	60	Fairly Good
3	AR	5	4	5	4	18	45	Very Poor
4	AAF	7	7	6	8	28	70	Good
5	AS	5	5	7	5	22	55	Poor
6	FA	6	4	5	5	20	50	Very Poor
7	FR	6	5	6	5	22	55	Poor
8	HDJ	6	5	5	6	22	55	Poor
9	HT	4	3	5	4	16	40	Very Poor
10	HRT	6	4	7	7	24	60	Fairly Good
11	IJM	4	4	5	6	19	47,5	Very Poor
12	IWD	5	6	6	5	22	55	Poor
13	IWN	6	5	6	4	21	52,5	Very Poor
14	MB	6	5	7	7	25	62,5	Fairly Good
15	MI	4	3	6	5	18	45	Very Poor
16	MF	6	7	7	8	28	70	Good
17	NK	4	4	5	3	16	40	Very Poor
18	NAM	6	5	4	6	21	52,5	Very Poor
19	NA	6	4	6	6	22	55	Poor
20	NAY	5	5	6	7	23	57,5	Poor

21	NF	6	6	5	6	23	57,5	Poor
22	NFZ	7	7	6	8	28	70	Good
23	NFR	7	7	8	8	30	75	Good
24	RFS	5	5	7	6	23	57,5	Poor
25	RSB	5	5	6	6	22	55	Poor
26	SDF	6	5	5	6	22	55	Poor
27	SAK	4	4	5	4	17	42,5	Very Poor
28	SH	5	5	6	6	22	55	Poor
29	SNT	6	5	5	6	22	55	Poor
30	ZN	5	4	4	6	19	47,5	Very Poor
31	NAH	7	7	7	8	29	72,5	Good
32	NH	5	4	6	5	20	50	Very Poor
33	AD	5	4	6	6	21	52,5	Very Poor
34	MN	6	5	6	5	22	55	Poor
	<b>Total</b>	<b>188</b>	<b>168</b>	<b>198</b>	<b>199</b>	<b>753</b>	<b>1882,5</b>	
	<b>Mean</b>	<b>5,53</b>	<b>4,94</b>	<b>5,82</b>	<b>5,85</b>	<b>22,15</b>	<b>55,37</b>	<b>Poor</b>

The table above shows the scores on the pre-test based on the criteria for speaking skills, namely vocabulary, comprehension, fluency, and pronunciation. To find out the student's speaking score in the pre-test by dividing the student's total score by the maximum score, then multiplying it by 100. Based on the pre-test results, the data shows that the average score in the pre-test is 55.37 with a total score of 753. From This analysis shows that almost of the 34 students' speaking skills are still poor and most of them have very low scores in comprehension and pronunciation and their accents are not very fluent because they speak with many pauses and the vocabulary they use is sometimes irregular.

#### b. The Students Score in Post-test

The researcher gave 4D flashcards to students as a post-test to determine students' speaking abilities. In this post-test students are given the same 4D flashcard images at the pre-test stage. After giving the post-test to the students, the researcher found out the results of the students' speaking skills based on the criteria for speaking skills, namely fluency, comprehension, vocabulary and pronunciation before giving treatment. The results will be presented in the following table:

**Table 2. The students score in post-test**

No.	Name	voc.	comp.	flue.	Pron.	score	Konv.	Classification
1	AZ	6	6	7	7	26	65	Fairly Good
2	AMP	7	7	9	9	32	80	Very Good
3	AR	6	7	6	7	26	65	Fairly Good
4	AAF	8	7	8	9	32	80	Very Good
5	AS	6	7	7	8	28	70	Good
6	FA	7	5	6	6	24	60	Fairly Good
7	FR	8	7	7	8	30	75	Good
8	HDJ	8	7	8	8	31	77,5	Good
9	HT	6	7	8	7	28	70	Good
10	HRT	8	8	9	8	33	82,5	Very Good
11	IJM	6	7	8	7	28	70	Good
12	IWD	7	6	8	7	28	70	Good
13	IWN	7	7	8	6	28	70	Good
14	MB	8	7	9	8	32	80	Very Good

15	MI	6	6	7	6	25	62,5	Fairly Good
16	MF	7	8	9	9	33	82,5	Very Good
17	NK	7	6	7	6	26	65	Fairly Good
18	NAM	7	6	7	6	26	65	Fairly Good
19	NA	7	6	8	7	28	70	Good
20	NAY	6	7	7	8	28	70	Good
21	NF	7	6	7	7	27	67,5	Fairly Good
22	NFZ	8	7	9	9	33	82,5	Very Good
23	NFR	8	7	8	8	31	77,5	Good
24	RFS	6	6	8	7	27	67,5	Fairly Good
25	RSB	7	6	8	8	29	72,5	Good
26	SDF	7	6	7	7	27	67,5	Fairly Good
27	SAK	7	6	6	6	25	62,5	Fairly Good
28	SH	7	7	8	7	29	72,5	Good
29	SNT	7	6	7	8	28	70	Good
30	ZN	6	5	6	7	24	60	Fairly Good
31	NAH	8	8	9	9	34	85	Very Good
32	NH	7	6	8	7	28	70	Good
33	AD	6	5	6	7	24	60	Fairly Good
34	MN	7	6	8	7	28	70	Good
	<b>Total</b>	<b>236</b>	<b>221</b>	<b>258</b>	<b>251</b>	<b>966</b>	<b>2415</b>	
	<b>Mean</b>	<b>6,94</b>	<b>6,50</b>	<b>7,59</b>	<b>7,38</b>	<b>28,41</b>	<b>71,03</b>	<b>Good</b>

After qualifying, students get a score in the post-test based on the criteria of speaking skills, namely vocabulary, comprehension, fluency and pronoucation. From the table above it can be seen about the value of students 'speaking skills on the post-test, to determine the score of students' speaking skills on the post-test, the researchers divided the total score with the maximum score, then multiplied by 100.

In the table above we can know the frequency of classification of scores achieved by students and show the results of improving students speaking skills after using augmented reality in 4D flashcard. Based on the post-test results, the data showed that the average score achieved by students was 71.03. This means that students speaking skills have improved through the use of augmented reality in 4D flashcard with a total score on the post-test is 966. This proves that there is an increase in student scores on the post-test. From the post-test analysis, it was seen that almost 34 students had fairly good and good speaking skills. In addition, the post-test also shows that there are no students who failed the classification.

c. The Rate Percentage of the Frequency of the Pre-test and Post-tes

The researcher compared by calculating the percentage of students classification score namely very good, good, fair, poor and very poor. The result the rate percentage of the frequency of the pre-test and post-test were presented in the following table:

**Table 3. The rate percentage of the frequency of the post-test**

No.	Category	Score	Pre-test		Post-test		Percentage
			Q	%	Q	%	
1	Very Good	80-100	0	0%	7	21%	1%
2	Good	70-79	5	15%	15	44%	1%

3	Fairly Good	60-69	3	9%	12	35%	1%
4	Poor	55-59	14	41%		0%	0%
5	Very Poor	<55	12	35%		0%	0%
<b>Total</b>			<b>34</b>	<b>100%</b>	<b>34</b>	<b>100%</b>	<b>3%</b>

As explained in the table, it shows the percentage of pre-test and post-test levels increased, the average score of students' speaking skills before using augmented reality in 4D flashcard, most of the students were in the poor classification with a percentage of 41%. This shows that the students' speaking ability in the pre-test was low, because some students got very poor, fairly poor scores and there were also some students who got good scores.

While the average score of students speaking skills after being given treatment using augmented reality in 4D flashcards, experienced a significant increase. In this post-test there was a 29-fold increase in the good category, where most students scored 21% in the very good category, 35% in the fairly good category, while there were none in the poor and very poor categories. So it can be concluded that the percentage in the post-test, students were able to improve their speaking skills using augmented reality in 4D flashcards.

#### d. Hypothesis Testing

To find out degree of freedom (df) the researcher used the following formula :

$$\begin{aligned} Df &= N-1 \\ &= 34-1 \\ &= 33 \end{aligned}$$

To go with data analysis, researcher took significant level ( $\alpha$ ) on 5% or 0,05, while the degree of freedom (df) was 33 to know the value of t- table. This t-table value of research was also be shown automatically on date analysis of Microsoft Excell. For a significant level ( $\alpha$ ) 5%, and df = 33.

#### e. Auto-calculation from Data analysis on Microsoft excell

The data found during the researcher were then processed automatically through the MS Excel application on the data analysis menu. The results of the auto-calculation are presented in the following table:

**Table 4. Auto-calculation from Data analysis of Microsoft Excel**

	Pre-test	Post-test
Mean	55,37	71,03
Variance	75,43	49,67
Observations	34,00	34,00
Pearson Correlation	0,77	
Hypothesized Mean Difference	0,00	
Df	33,00	
t Stat	16,46	
P(T<=t) one-tail	0,00	
t Critical one-tail	1,69	
P(T<=t) two-tail	0,00	
t Critical two-tail	2,03	

There are 4 things that need to be considered in determining the success or failure of this research, namely Mean, observations (sample), t Stat (t-Test) and t Critical two-tail (t-Table). The research is said to be successful when there is a significant increase in the average value of the pre-test and post-test, this is indicated by the t-test value being higher than the t-table value.

The t-table value is 2,03 while the t-test value is 16,46. meaning that the value of the t-test is greater than the t-table ( $16,46 > 2,03$ ). thus, it can be automatically concluded that there is a significant difference between students' speaking skills before and after being given treatment through "the use of augmented reality in 4D flashcards at SMAN 7 Pinrang. This shows that the alternative hypothesis ( $H_a$ ) was accepted and the null hypothesis ( $H_o$ ) is rejected. So, it cannot be denied that " the effect of using augmented reality on 4D flashcards" can improve speaking skills at SMAN 7 Pinrang.

#### CONCLUSION

English listening materials in EFL classroom are categorized into three. They are media, content, and exercise. Media is material used to present learning content. Content is learning themes and topics. Then, exercise is learning activity relates to content. The materials relate to media covers video, audio compact disk, and textbook. The contents of material are presented in form of monologue, dialogue, and song. The learning activities for listening skill teaching are repetition, cloze test, and multiple-choice. English listening materials are in line to English curriculum. Teachers use materials and methods that are suitable to English listening skills learning outcomes.

From the results of the pre-test according to the data above, the average student shows a low vocabulary while vocabulary has an important role in students speaking skills, because the quality of a person's language skills clearly depends on the quantity and quality of the vocabulary they have. As explained in the previous chapter, without sufficient vocabulary, we cannot communicate effectively or cannot express ideas in spoken and written form. At this stage students have varying values because some students are able to name some vocabulary that can be understood, while some students can express simple words, and some students can express vocabulary that varies and can be used in formal conversations.

The results of the pre-test according to the comprehension assessment data showed low results from all aspects of the assessment, this can be seen from the students knowledge which was still limited due to several things, such as students who rarely used English in their daily activities, but there were some students are able to explain the pictures on the 4D flashcard. Understanding is also assessed from the way of spelling, pronunciation and grammar.

Then on the results of the pre-test according to the fluency assessment data, students speaking skills showed quite low results and were assessed from several aspects such as predetermined time, student thinking time, number of corrections, and number of repetitions of words. In this pre-test, the average student has not been able to describe their answers properly. Meanwhile, the results of the pronunciation assessment showed quite high results from all aspects of the assessment.

English pronunciation is important where many sounds and words in English are difficult to pronounce correctly. therefore most of the students still often pronounce wrong but can still be understood by researchers. In addition to these aspects, students' confidence in speaking English is still very low due to several factors, especially environmental factors, both within the school environment and outside the school environment.

So, from the explanation above it can be concluded that the pre-test data shows the average classification is in poor, very poor, fairly good, and good after the calculation by quantitative methods. As well as data showing the percentage on the average pre-test assessment of students included in the poor classification. While the average results of students showed that almost all showed low results on the assessment of vocabulary and comprehension

As is known, the average value is the value obtained from the total number of values on the scale divided by the number of samples. In the general case the mean value can be interpreted as a number that represents the entire dataset. The average value is obtained from the sum of all values in each data, then divided by the number of existing data. Mean is a statistical indicator that can be used to measure the average of a data. The mean or average is the total amount of data divided by the amount of data. From the researcher, data calculations for vocabulary, comprehension, fluency, and pronunciation pre-test values were processed automatically using Microsoft Excel on the data analysis menu. Then the overall results in the pre-test show an average value of 55,37 with low qualifications.

The learning model using 4D flashcard basically only requires imagination and creativity. The wider the imagination and creativity, the richer the model created will be. As with speaking skills, the more we are trained in mastering aspects of speaking skills, the easier it is for us to communicate properly and correctly. 4D flashcard using the Octagon Studio 4D+ application is a learning media developed using augmented reality (AR) technology or what is known in Indonesian as augmented reality. Augmented reality is a technology that combines two-dimensional and or three-dimensional virtual objects into a three-dimensional real environment and then projects these virtual objects in real time. Using 4D flashcard media can improve aspects such as sharpening students' memory, so this can improve several aspects of the assessment of speaking skills such as vocabulary, comprehension, fluency, and pronunciation.

Before determining the results of the assessment of speaking skills at the post-test stage, the researcher conducted a treatment first with the students. At the treatment stage, the researcher studied the use of augmented reality in 4D flashcards. The treatment process is that the researcher divides students into several groups in pairs, after that the researcher gives 4D flashcards and cue cards to each group, in each group students will get one 4D flashcard and one cue card, so students who receive 4D flashcards will answer questions from students who received cue cards in an oral and descriptive way, then the researchers randomized the 4D flashcards and cue cards at each meeting.

There are three themes used in 4D flashcards, namely, the occupation theme, the animal theme, and the ocean theme. Among these themes the researcher chose the occupation theme to be used as test material at the pre-test and post-test stages. Then on the Cue card there are several questions in 3 types of themes, namely on the occupation theme there are seven questions, on the animal theme there are six questions and on the ocean theme there are four questions.

After the researcher gave treatment to students, to find out whether there was an increase in students' speaking skills. Similar to what the researcher did at the pre-test stage, in the post-test section the researcher also provided 4D flashcards and the same theme as at the pre-test stage so that the researcher could assess whether there was progress in students' speaking skills after being given treatment. At the post-test stage the researcher assessed four aspects of the same assessment categories at the pre-test stage, namely vocabulary, comprehension, fluency, and pronunciation.

At this post-test stage, vocabulary and comprehension became one of the things that was rather difficult for students to do (Allen, 1977). As it is known that vocabulary is an important part in all languages where the learner or student must continuously learn words, when the learner or student is also studying grammar or structure and pronunciation. Knowing a lot of vocabulary is meaningless if students cannot pronounce the vocabulary properly and also no one can understand the words or sentences used in communication. Confidence in speaking that students have would appear if they train themselves, remember and continuously learn to master aspects of speaking skills.

From the explanation and findings of the data in the post-test, the researcher can conclude that the post-test data shows that the average classification is in fairly good, good, and very good after calculations are carried out using the quantitative method. As well as data that shows the percentage in the post-test assessment, the average student has a score on the good qualification. From the researcher, the data calculations for vocabulary, comprehension, fluency, and pronunciation post-test values were processed automatically using Microsoft Excel on the data analysis menu. Then the overall results in the pre-test show an average value of 71,03 with good qualifications.

From the results of the researchers findings, seen during the observation period or during several meetings by teaching using augmented reality in 4D flashcards, students did experience a significant increase after being given treatment, although there were still deficiencies in several assessment categories.

After the researchers observed the students learning styles and also the development of students in learning English, especially in speaking ability. Researchers can assess students learning styles to the development of students abilities to receive lessons before and after treatment in using augmented reality in 4D flashcards. This assessment was calculated by the researchers automatically using Microsoft Excel on the data analysis menu.

Judging from the assessment during the pre-test shows that the ability of students, both in learning styles to the level of their ability to speak English, is in the poor qualification. Not only from the aspect of speaking, the things that support the aspects of speaking skills are also not too well mastered by students. However, there are some students who have an interest in learning English and some students say that learning English is a difficult thing to do, coupled with difficult pronunciations to pronounce, the difference between writing and pronunciation, and there is also a vocabulary that must be understood and difficult to understand. remember. This makes students not too interested in learning English, especially in speaking skills, causing students sometimes not to pay too much attention to the teacher in learning English.

Some students who don't care about English subjects thought they are a bit difficult and unpleasant, but after being given treatment the students look happy and like using 4D flashcard media. This is because 4D flashcard media uses Android-based tools. How to use the 4D flashcard using a mobile phone, the first thing to do is download the Octaland 4D, Animal 4D+, and Ocean 4D+ application on the PlayStore or App Store (iOs), then enter the code or serial number on the 4D flashcard, after that place the cellphone on top or in front of the 4D flashcard, during scanning give a distance so that all pictures are visible on your mobile screen. In addition, students are also given the opportunity to take turns to try to display 4D flashcard images through screen mirroring on laptops and mobile phones which are then connected to the projector screen. As for how to display a 4D flashcard image to the projector screen is to download the ApowerMirror application on your laptop and cellphone, then open the ApowerMirror

application on your laptop and cellphone, select the QR Code on your laptop, scan the barcode that appears on the laptop using your cellphone, then your cellphone screen will be connected to the laptop, after that select the Octaland 4D, Animal 4D+ or Ocean 4D+ application that has been downloaded previously, enter the code or serial number that is 4D flashcard, place the 4D flashcard on or in front of the cellphone, then during the scan space it so that all images are visible on the laptop screen and connect the laptop to the projector and speakers to make it clearer.

So that's the reason why researchers want to use augmented reality in 4D flashcards in teaching English especially on students speaking skills. Using 4D flashcard media can remind and guide students to something related to picture, sounds, and text. In addition, 4D flashcard is a new, fun, and unique learning medium. So in this way, researchers use augmented reality in 4D flashcards to improve English language skills, especially on students speaking skills, even if little by little.

After learning by using augmented reality in 4D flashcards in class XI MIPA 3, at first they looked stiff and lacked confidence in speaking but the researcher continued to provide motivation and advice to them to remain confident in speaking English and in the end they continued to practice in speak English, until the last meeting the students were able to pronounce it well.

After looking at several aspects before and after the treatment, starting from vocabulary, comprehension, fluency, and pronunciation, all of these aspects have improved in line with the researchers expectations. Using augmented reality in 4D flashcards can improve speaking skills because apart from being unique and fun, 4D flashcards are also able to develop students' memory and train students' concentration abilities. So it can be said that not only the data results from research findings have increased but the use of augmented reality in 4D flashcards in teaching speaking skills during research can increase.

Like the results that have been found from the pre-test to the post-test stage, the researcher found the results of a significant increase in students speaking skills using augmented reality in 4D flashcards. After doing several meetings the students get a new vocabulary and they can remember it well because the vocabulary is often used during several meetings, students also have a fairly good comprehension, and fluency, which at first students were a bit stiff in pronunciation now they are confident in communicating.

There was also an increase in the students speaking skill in the comprehension assessment aspect, seen from a fairly good understanding and a normal speaking speed, then students were also able to understand conversations within the range of experience they had. For fluency, students ability in speaking skills is at a good qualification, some students are able to handle their confidence in speaking and where students are able to discuss their interests in certain competencies easily. In addition there are some students who belong to the category of being able to follow any conversation within the range of experience with good fluency. For pronunciation at the post-test stage, the category that students have is quite good compared to the pre-test stage. In the assessment of this category, the average student's pronunciation can be understood even though there are mistakes, and some students have said it but it's still not quite right but it doesn't interfere with students concentration.

During several meetings the researchers tried hard to improve the competence of students speaking skills. Therefore, learning English should be done repeatedly so that they can continuously hone their memory. In the audiolingual method language is a habit,

it is hoped that students will practice in various languages, especially in English, both in listening skills and speaking skills so that students are able because they are used to it.

## CONCLUSION

Regarding the research findings, the researcher proposed a conclusion namely, data analysis test research shows that there is a significant increase between students speaking skills before and after being taught using augmented reality in 4D flashcards, evidenced by an increase in the average score at the pre-test stage from 55,37 to 71,03 at the post-test stage test while the t-test value is 2,03 greater than t-table 16,46. This means that the null hypothesis (H<sub>0</sub>) is rejected and the alternative hypothesis (H<sub>a</sub>) is accepted. Therefore, the effect of using augmented reality on 4D flashcards is able to improve the second-grade students speaking skills at SMAN 7 Pinrang.

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