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DETECTION OF PRONUNCIATION ERRORS IN ENGLISH SPEAKING SKILLS BASED ON ARTIFICIAL INTELLIGENCE (AI)

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ABSTRACT

Pronunciation has close relationship to the speaking skill, one of the main skill learning in English. One of the AI applications to help students to learn and to measure the students' the pronunciation is ELSA (English Language Speech Assistant). The problem of the study were: What is the pronunciation error in English speaking skills based on Android app ELSA as early detection? And How does Android app ELSA work early detection pronunciation error in English speaking skills?. The aims of this study were to detect pronunciation errors in speaking skills using ELSA application and the results have a big contribution in pronunciation strategy in teaching English speaking skills. The method of this study was qualitative content analysis. The subject of the study were 10 students in STKIP Budidaya Binjai in English Department. The finding of this study was detected by intonation, fluency, and pronunciation. It was varied from all participants based on their ability in English pronunciation. In detail pronunciation error categorize into several aspect evaluation such as TH Sounds, Nasals, Schwa, Consonant Clusters, Diphthongs, R Sounds, Ending Sounds, Intonation and many more. All of the categorization displays in the percentage system.

Keywords: *Pronunciation, English speaking Skills, AI, ELSA Application*

I. INTRODUCTION

Pronunciation becomes part of the assessment aspect in English Speaking Skills; it becomes a special attention because pronunciation is an interesting initial appearance to be heard when someone speaks in English speaking skills. Throw this measure to be the determinant of someone skilled in English Speaking Skills after which is the mastery of grammar (Sihotang et al., 2021). Moreover, pronunciation became an important part in the aspect of English Speaking Skills as an early appearance in a communication especially for Indonesian students who study English because learning English vocabulary is different symbols and sounds then this is an important aspect to learn (Antaris & Omolu, 2019).

According to Agung et al., (2021) as a student, there are two factors that cause students to have difficulty learning pronunciation. First, the sound system in English has some strange sounds for students. Second, the way native speakers pronounce endings in each word is very different from what students have learned, so this makes it difficult for them to reach out of the principle of English pronunciation. Indonesian students have deficiencies in pronunciation in English Speaking Skills due to the comparison of their mother tongue with English as a foreign language especially students who are in the City of Medan who have a variety of tribes, indigenous languages, cultures, customs and others. This affects the way they speak and speak in English. Their mistake is that they tend to pronounce words like echoes, especially on consonants. A common problem that often occurs among Indonesian students in learning English pronunciation is due to the differences in the sound system between Indonesia and English.

There are several voices in English that do not exist in Indonesian. Indonesian and English have different consonants. All consonants in Indonesian must be pronounced clearly, while in English it is not so. There are several consonants in English that are spoken quietly. For example, /b/ sounds in words limb, comb, climb; /c/ voices in words scissor, scenario, fascinate; /k/ voices in words knot, knife, knight; /n/ voice in words autumn, column, solemn; /t/ in words castle, listen, often; and

/w/ voice in words wrap, write, wrong. All these words are spoken in silence (Dwi Adeline, 2020). This statement emphasizes the existence of significant differences in the aspects of the voice system between the two languages so making the pronunciation quite interesting discussed in terms of English speaking skills. English speaking skills are areas required in communicating that are used by everyone around the world to share ideas with each other and communicate through speech, especially the most useful English speech worldwide (Namaziandost & Nasri, 2019).

In addition, pronunciation has a big issue about reason of English varieties used happened in Indonesian students because mostly Indonesian students don't use the standardization in pronunciation aspect. the classical problems happens in such area of pronunciation namely less motivated to extra practiced, lack of simulation, and old style method in teaching and studying pronunciation (Indari & Afdhalina, 2023).

To know the existence of problems in pronunciation need a correct measurement tool because English speaking skills have special characteristics in its form because it must be verbal rather than written. Then the Android app ELSA came to measure student ability in terms of pronunciation in the aspect of English speaking skills. ELSA is an artificial intelligence (AI) application that focuses on the field of education especially in terms of pronunciation. The app helps students in hearing, pronouncing, proclaiming, chanting, and affirming English words in the oral language (Kholis, 2021). Base on the previous study, ELSA (English Language Speech Assistant) Speak Application gave positive effects on students' speaking ability. It showed by the improvement of students' speaking scores. Hence, ELSA (English Language Speech Assistant) Speak Application became the suitable media used by the teacher in teaching speaking (Aswaty & Indari, 2022). The problem of the study is:

1. What is the pronunciation error in English speaking skills based on Android app ELSA as early detection?
2. How does Android app ELSA work early detection pronunciation error in English speaking skills?

This study aims to detect pronunciation errors in speaking skills using ELSA application. The results have a big contribution in pronunciation strategy in teaching English speaking skills.

A. Pronunciation

In the pronunciation there is a code within it, of course this code has a standard for the user or speaker of the language. From the existence of this principle makes diversity in terms of pronunciation in each language user based on the character of its mother tongue and culture. From these characters emerged three levels of English pronunciation by opinion (Antaris & Omolu, 2019), as follows:

a. People often don't understand what you want to say. You use the wrong sound in English words.
b. People can understand what you want to say, but they have to concentrate to understand you.
c. People can understand you easily. Your speech is clear and pleasant.

The differences between speakers in terms of pronunciation in English cause the emergence of problems in communicating so there is an explanation of the factors affecting pronunciation and errors in pronunciation.

B. Factors affecting pronunciation

Everyone has a distinctive trait or character in communicating and the way a person speaks using a foreign language is largely influenced by his or her mother tongue. There are many factors that influence a person's pronunciation as stated by Tambunsaribu & Simatupang (2021) in Brown, such factors are native language (mother language), age (age), exposure (exposure), innate phonetic ability (phonetic abilities), identity (identity), and language ego (language ego), motivation (motivation) and concern for good pronunciation (pay attention to good

speech). The mother tongue largely influences language learners to learn a foreign language. In terms of age, a child under the age of puberty can speak with excellent vocabulary, speaking like a native speaker, if he continues to reveal the original context. In exposure factors, a person who has lived in a foreign country for some time may not be able to adapt to the culture or language in that foreign country. The innate phonetic ability factor means that one can adapt well a phonetic coding of a foreign language but for some others not. In terms of identity and language ego, a person's attitude toward the target language speaker can affect the speaker's ability to successfully learn a foreign language. In addition, the motivation to have a good pronunciation, one may pay attention to the pronunciation of the language he is learning, but for some other learners may not.

C. Errors in Pronunciation

According to Kelly in (Tambunsaribu & Simatupang, 2021) mention that there are several reasons why some L2 learners (foreign language speakers) have some problems related to difficulty in L2 pronunciation, such as:

a. The student's mother tongue may have a relationship between sound and spelling;
b. A L2 learner may first get acquainted with the English sounds associated with the new sound spelling relationship as he learns English;
c. There may be some voices in their native language that do not have English;
d. There may be some English voices that do not have their mother tongue; and
e. Pressure patterns and English intonation can be weird and confusing for English learners.

D. The Android app ELSA

1). Screen Display of ELSA

The display and content of the ELSA Speak app are shown in Figure 1 and Figure 2.

Figure 1
Screen Display of ELSA

The English Learning Speech Assistant (ELSA) was designed by Vu Van in 2015 in San Francisco, USA. The app uses Artificial Intelligence (AI) and speech recognition to help improve and improve English pronunciation. The ELSA Speak app can detect user pronunciation errors in users with an accuracy of more than 95%. The app can also receive advanced feedback to correct its pronunciation errors (Astri Wahyu Dini, Nadia Alifa Nur Aenida, Ulfah Fauziah, 2020).

2). Content in the Android app ELSA

ELSA Speak is the world's smartest English pronunciation trainer that can listen to the way you pronounce words and sentences to show mistakes accurately and give accurate judgments. ELSA can give you specific advice to improve your English skills (*ELSA*, n.d.).

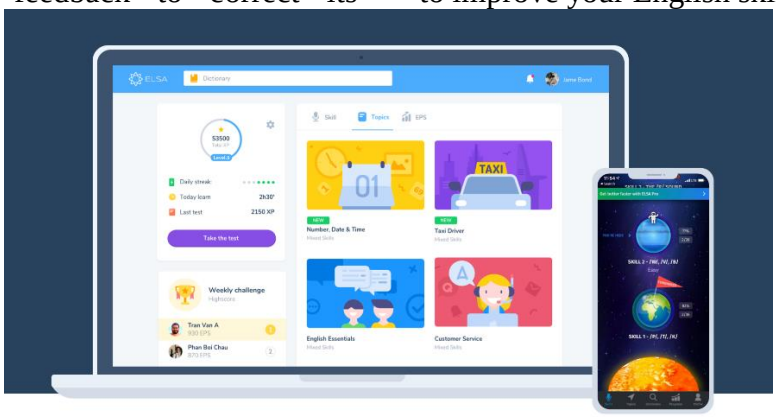
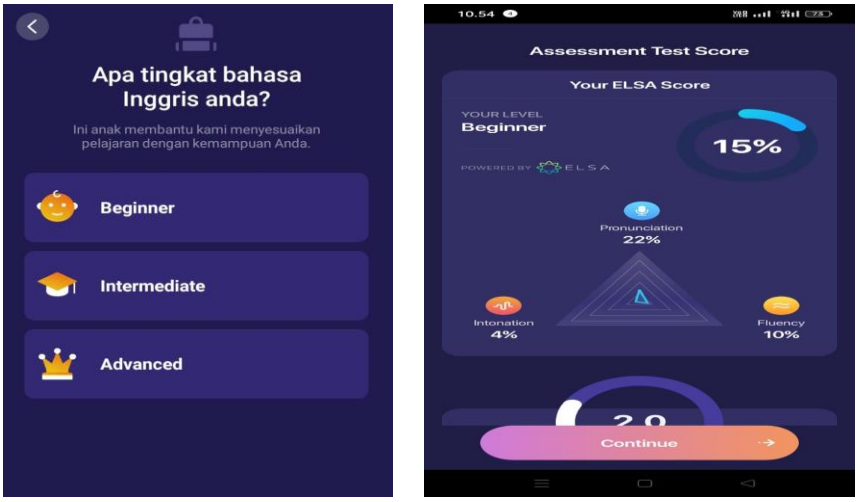


Figure 2
Content Display of ELSA

The ELSA app has several features that greatly help students be proficient in English. The best feature is in terms of pronunciation. The menu that appears in the ELSA special material pronunciation focuses in this study, namely:

1. Intonation
2. Fluency
3. Pronunciation

From the presence of judgment in terms of pronunciation students easily detect errors and shortcomings in regard to pronunciation. Working on this application, students are directed to do registration at the time of starting on this app. Then it is directed to fill in personal data according to personal data, then it is guided to user level (beginner, intermediate, or advanced) after choosing the user level will be directed into the next stage, namely test pronunciation. Users will be given several tests by reading the sentences that will appear on the screen, then users will read them by voice recording and then the audio recording will be detected by the application to evaluate the components of pronunciation assessment.



Picture 3
Level and Criteria Display of ELSA

II. METHOD

The study was used qualitative content analysis. Effective qualitative data analysis plays a critical role in research especially in educational studies. Qualitative data analysis is based on naturalistic inquiry that entails identifying key themes as provided by study participant. Qualitative content analysis goes beyond counting words or extracting objective content from texts to examine meanings, themes and patterns that may be manifest or latent in a particular text (Shava et al., 2021). The subject of the study was students in STKIP Budidaya Binjai in English Department with all semester. The total students were 10 who had in different semester. The study chose in different semester because it wanted to know varieties in the result.

The instrument of the study was ELSA application as AI tool in speaking skills. It contained several menus suitable for the user's need. The instrument chose the beginning test for a new comer. Technique of collecting data was used a test for every step in ELSA display. It focused in pronunciation area which was intonation, fluency and pronunciation as the result. The procedure of the study was followed: a). downloaded the application, b). registered the application, c). followed the test steps, d). checked the result. The students had downloaded the apps suitable for the smartphone setting. Then, they registered by their own personal data. After that they start to choose the display menu on apps. The target was beginning level test to know how their ability in speaking skills focusing the pronunciation area. They followed every step by instructions and going to start the test. The test was 15 questions by voice recording detection. The end of collecting data was the test result and found the scores. The analysis method was used by documentation. By the test result from the apps, the analyzing data was started to analyze the intonation, fluency, and pronunciation on percentage.

III. FINDINGS AND DISCUSSIONS

A. Findings

The data was from the test by apps. The total participants were 10 respondents. The varieties respondents affected with the test result. The data test results were followed:

Table 1
Test Result

No.	Initial Respondents	Semester	Pronunciation Aspect			Scoring Percentage
			Intonation	Fluency	Pronunciation	
1	AA	II	4	10	22	15%

2	MR	VIII	58	58	60	59%
3	DW	VIII	53	54	65	61%
4	WR	II	32	33	42	39%
5	TR	II	53	64	58	57%
6	TAL	VI	54	53	53	53%
7	MWI	VI	50	52	57	55%
8	AGSS	VI	40	45	60	53%
9	HM	II	62	63	50	53%
10	YMS	II	19	19	25	23%

The pronunciation error as a detection by using ELSA in speaking skills was intonation, fluency, and pronunciation. According Nurullayevna (2020) to intonation is one of the area in correct pronunciation. The intonation of speech is a way of interpreting its content, providing mutual understanding and knowledge. Words and their meanings are the first keys to understanding the text. Their specific grammatical forms and combinations are the second. But the main key is intonation with its melody, pauses and stress that reveals their true content. The wrong intonation will not prevent the interlocutor from understanding what people said. Even if an interlocutor mutters monotonously, but at the same time pronounces words properly and correctly builds sentences, listeners will understand him. But an English-speaking companion will not be able to understand with what feeling and for what purpose a person said it.

Fluency is one the major learning goals in the context of the learning and teaching of Second Language (L2) speaking skills. Some of the problems in fluency happened during speaking are breakdown fluency, speed fluency, and repair fluency. Breakdown fluency refers to pausing behavior including frequency, location, and duration of pauses. Speed fluency reflects the speed of delivery. Repair fluency is concerned with dysfluency phenomena such as repetitions and false starts (Suzuki & Kormos, 2020).

The pronunciation categorized into several types of pronunciation error, as followed:

Table 2
Types of Pronunciation Error

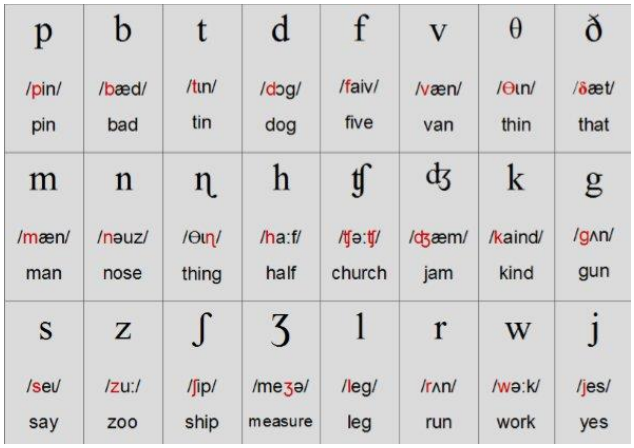
No.	Initial Respondents	Types of Pronunciation Error	Percentage
1	AA	a. /l/, /r/	50%

		b. /i/, /I/	32%
		c. /w/, /v/, /b/	21%
		d. /s/, /ʃ/, /z/	49%
		e. /eI/, //ɛ/, /æ/	40%
		f. /u/, /ʊ/	16%
		g. /æ/, /ʌ/, /ɑ/	53%
		h. /h/, /f/, /v/	27%
		i. TH sounds: /ɵ/, /ð/	18%
		j. R Sounds: /r/, /ɝ/, /ɚ/	45%
		k. Nasals: /m/, /n/, /ŋ/	37%
		l. Consonant Clusters	36%
		m. Ending Sounds	27%
		n. Diphthongs	15%
		o. /ʃ/, /ʒ/, /tʃ/, /dʒ/	3%
		p. /j/ (y), /ʒ/, /dʒ/	8%
		q. /p/, /t/, /k/	36%
		r. Schwa: /ə/	45%
		s. Intonation	4%
		t. Mixed Skills	22%
2	MR	a. /j/ (y), /ʒ/, /dʒ/	25%
		b. /ʃ/, /ʒ/, /tʃ/, /dʒ/	27%
		c. /h/, /f/, /v/	40%
		d. /w/, /v/, /b/	42%
		e. TH sounds: /ɵ/, /ð/	53%
		f. Schwa: /ə/	55%
		g. Ending Sounds	57%
		h. /eI/, //ɛ/, /æ/	67%
		i. /s/, /ʃ/, /z/	66%
		j. /u/, /ʊ/	73%
		k. /æ/, /ʌ/, /ɑ/	74%
		l. Diphthongs	76%
		m. R Sounds: /r/, /ɝ/, /ɚ/	75%
		n. /i/, /I/	77%
		o. /l/, /r/	80%
3	DW	a. TH Sounds: /ɵ/, / ð/	24%
		b. /j/ (y), /ʒ/, /dʒ/	47%
		c. /ʃ/, /ʒ/, /tʃ/, /dʒ/	60%
		d. Diphthongs	62%
		e. /h/, /f/, /v/	62%
		f. Ending Sounds	66%
		g. /æ/, /ʌ/, /ɑ/	66%
		h. /i/, /I/	71%
		i. /eI/, //ɛ/, /æ/	70%
		j. /s/, /ʃ/, /z/	73%
		k. /u/, /ʊ/	73%
		l. Schwa: /ə/	74%
		m. /w/, /v/, /b/	77%
4	WR	a. /ʃ/, /ʒ/, /tʃ/, /dʒ/	25%
		b. /j/ (y), /ʒ/, /dʒ/	33%
		c. /w/, /v/, /b/	44%
		d. Ending Sounds	46%
		e. /i/, /I/	49%
		f. TH Sounds: /ɵ/, / ð/	49%
		g. Diphthongs	50%
		h. /æ/, /ʌ/, /ɑ/	51%
		i. /h/, /f/, /v/	54%
		j. /eI/, //ɛ/, /æ/	56%
		k. /p/, /t/, /k/	56%
		l. Consonant Clusters	58%

		m. /s/, /ʃ/, /z/	58%
		n. R Sounds: /r/, /ɝ/, /ɚ/	62%
		o. Nasals: /m/, /n/, /ŋ/	62%
		p. /u/, /ʊ/	67%
		q. /l/, /r/	79%
5	TR	a. Diphthongs	42%
		b. /j/ (y), /ʒ/, /dʒ/	44%
		c. /ʃ/, /ʒ/, /tʃ/, /dʒ/	45%
		d. /i/, /I/	46%
		e. /w/, /v/, /b/	54%
		f. TH Sounds: /ɵ/, / ð/	63%
		g. R Sounds: /r/, /ɝ/, /ɚ/	64%
		h. Ending Sounds	67%
		i. /s/, /ʃ/, /z/	69%
		j. /eI/, //ɛ/, /æ/	70%
		k. /h/, /f/, /v/	70%
		l. Schwa: /ə/	71%
		m. /æ/, /ʌ/, /ɑ/	71%
		n. /l/, /r/	74%
		o. Nasals: /m/, /n/, /ŋ/	73%
6	TAL	a. TH Sounds: /ɵ/, / ð/	25%
		b. /j/ (y), /ʒ/, /dʒ/	30%
		c. /ʃ/, /ʒ/, /tʃ/, /dʒ/	30%
		d. /i/, /I/	41%
		e. /w/, /v/, /b/	54%
		f. /s/, /ʃ/, /z/	57%
		g. Diphthongs	58%
		h. Consonant Clusters	60%
		i. /eI/, //ɛ/, /æ/	66%
		j. Ending Sounds	66%
		k. Schwa: /ə/	70%
		l. R Sounds: /r/, /ɝ/, /ɚ/	71%
		m. /u/, /ʊ/	72%
		n. /p/, /t/, /k/	73%
		o. /l/, /r/	74%
		p. /æ/, /ʌ/, /ɑ/	73%
		q. /h/, /f/, /v/	73%
		r. Nasals: /m/, /n/, /ŋ/	78%
7	MWI	a. /j/ (y), /ʒ/, /dʒ/	28%
		b. /eI/, //ɛ/, /æ/	39%
		c. /ʃ/, /ʒ/, /tʃ/, /dʒ/	41%
		d. /h/, /f/, /v/	41%
		e. TH Sounds: /ɵ/, / ð/	42%
		f. /w/, /v/, /b/	44%
		g. Diphthongs	44%
		h. /æ/, /ʌ/, /ɑ/	56%
		i. Ending Sounds	60%
		j. R Sounds: /r/, /ɝ/, /ɚ/	60%
		k. /i/, /I/	64%
		l. /s/, /ʃ/, /z/	70%
		m. /p/, /t/, /k/	71%
		n. /l/, /r/	80%
		o. Nasals: /m/, /n/, /ŋ/	80%
8	AGSS	a. TH Sounds: /ɵ/, / ð/	25%
		b. /w/, /v/, /b/	47%
		c. /j/ (y), /ʒ/, /dʒ/	52%
		d. /h/, /f/, /v/	54%
		e. Diphthongs	55%
		f. /i/, /I/	57%

		g. /ʃ/, /ʒ/, /tʃ/, /dʒ/	56%
		h. /s/, /ʃ/, /z/	63%
		i. Schwa: /ə/	64%
		j. /eI/, //ɛ/, /æ/	66%
		k. R Sounds: /r/, /ɝ/, /ɚ/	69%
		l. Ending Sounds	72%
		m. /u/, /ʊ/	74%
		n. /l/, /r/	77%
		o. /æ/, /ʌ/, /ɑ/	77%
		p. Nasals: /m/, /n/, /ŋ/	79%
9	HM	a. TH Sounds: /ɵ/, / ð/	17%
		b. Diphthongs	26%
		c. /ʃ/, /ʒ/, /tʃ/, /dʒ/	35%
		d. /j/ (y), /ʒ/, /dʒ/	34%
		e. /u/, /ʊ/	42%
		f. /i/, /I/	46%
		g. /h/, /f/, /v/	51%
		h. /w/, /v/, /b/	52%
		i. /eI/, //ɛ/, /æ/	55%
		j. /s/, /ʃ/, /z/	65%
		k. /p/, /t/, /k/	69%
		l. Ending Sounds	69%
		m. Consonant Clusters	69%
		n. /æ/, /ʌ/, /ɑ/	73%
		o. Nasals: /m/, /n/, /ŋ/	75%
		p. R Sounds: /r/, /ɝ/, /ɚ/	80%
10	YMS	a. /eI/, //ɛ/, /æ/	45%
		b. Nasals: /m/, /n/, /ŋ/	49%
		c. /l/, /r/	51%
		d. /p/, /t/, /k/	56%
		e. Schwa: /ə/	62%
		f. Consonant Clusters	65%
		g. Ending Sounds	32%
		h. /w/, /v/, /b/	33%
		i. /s/, /ʃ/, /z/	40%
		j. /æ/, /ʌ/, /ɑ/	41%
		k. /h/, /f/, /v/	41%
		l. R Sounds: /r/, /ɝ/, /ɚ/	44%
		m. /ʃ/, /ʒ/, /tʃ/, /dʒ/	7%
		n. Diphthongs	17%
		o. /j/ (y), /ʒ/, /dʒ/	18%
		p. /u/, /ʊ/	24%
		q. TH Sounds: /ɵ/, / ð/	24%
		r. /i/, /I/	28%

English also has many kinds of consonant; 24 sounds, whereas in Bahasa Indonesia there are only 21 sounds. The kinds of consonant sounds can be seen in the table below:



Picture 4
Consonant Sounds
Source : https://www.quora.com

These kinds of sound are tend to make the learners difficult to differentiate the sounds. They often make errors in sounding some sounds. The errors are prone to occur when the sounds have a slight similarity such as: back and bag, sheep and ship, boot and boat, she and sea, fan and van, and others. Error in sounding the vowel and consonant lead to misunderstand between speaker and listener and the information and messages in the conversation may not deliver appropriately (Tanjung, 2021).

The way of ELSA apps detected pronunciation error was analyzed by sounds. The test was prepared into several questions by saying sentences in voice recording. By voice recording the ELSA apps as AI machine creating as well as the user needs, from such a way processing it made the result revealing in the short time. It made so efficient in time result.

B. Discussion

English speaking skills is the substantial issue in teaching of second language. The components aspect affects in performance, so that must be carefully in preparation. The intonation, fluency, and pronunciation are represented among many areas components of speaking skills which should investigate for the future study. Based on the data, the respondents were from in various semester backgrounds. There is interested to discuss. The respondent's ability in English speaking skills especially in pronunciation using AI can't be predictable based on the degree of semester. It found that a respondent was in second semester had the same score with the sixth semester. Another case, the sixth semester had a low score comparing with the seconds semester. This happened because language learning key is a practice in the process especially in studying in speaking skills. Being a regular time practice, it makes to improve the language skills. In English speaking contains cognitive aspects and mental aspects. The cognitive aspects are vocabulary, grammatical structure, and pronunciation. Mental aspects are in psychological issue namely anxiousness and self-confidence (Octaberlina et al., 2022).

AI (Artificial Intelligence) is the newest issue in education; it makes a polemic in education industry because AI has a potential role to change a teacher profession in the education industry. AI has a weakness; AI can't be worked by psychology aspect comparing with the humans. A teacher in the school has a big potential character to teach students in the classroom. They have natural interaction; they can communicate based on the personal current circumstances. The positive function in AI for education is making to give the ideas in language teaching strategy. According to Anggraini (2022) says that ELSA Speak Application uses speech recognition technology that can help users to help improve their English pronunciation. ELSA Speak application provides more lessons and more topics for users to practice pronunciation, starting from practicing English words, phrases, and sentences. Another feature

that ELSA Speak application offers is an interactive dictionary, which will help users how to pronounce the word or phrase they are looking for. ELSA speak apps is coming for helping the teacher to use it in language teaching strategy.

IV. CONCLUSION

The study concludes that ELSA speaking application as AI has the most useful for detection pronunciation error in English speaking skills. The findings reveals pronunciation error captured in three areas aspect namely intonation, fluency, and pronunciation. The categorization has representation in the ELSA apps. In detail pronunciation error categorize into several aspect evaluation such as TH Sounds, Nasals, Schwa, Consonant Clusters, Diphthongs, R Sounds, Ending Sounds, Intonation and many more. All of the categorization displays in the percentage system.

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