Indonesian Journal of EFL and Linguistics, Vol 8(1), 2023

eISSN: 2503-4197, pISSN: 2527-5070
Available online at:
www. indonesian-efl-journal.org
doi: http://dx.doi.org/10.21462/ijefl.v8i1.567

An Acoustic Analysis of Chinese Indonesian Students in Pronouncing English Vowels: A Praat Study

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Abstract:

This research aims to describe the errors made by Chinese-Indonesian students of the English Department of the University of Sumatera Utara in pronouncing English vowels; to discuss the reason for those errors this research uses Richard's theory on causes of errors; and to overcome those errors using the phonetics transcription method and repetition drills. This research uses the Praat software to analyze the phonemes through the samples' voice recordings. This research is qualitative and quantitative research. The data of this research are voice recordings of the samples and native speakers and the questionnaire answers of the samples. It is found that the Chinese-Indonesian students of the English Department who have passed the phonology subject still produce errors in pronouncing English vowels. It is concluded that these errors are found due to the effect of their mother tongues, namely Hokkien-Indonesian. The errors are also caused by the samples' intralingual and developmental errors. In order to overcome those errors, this research employed the phonetic transcriptions method and repetition drills and found that the methods improve the overall values of selected English vowel phonemes.

Keywords: *acoustic analysis, Praat, Chinese Indonesian*

1. INTRODUCTION

Richard and Schmidt (2002) define linguistics as the study of language as a system of human communication, which includes many different approaches to the study of language and many different areas of investigation. The areas which belong to linguistics are phonology, which is the study of speech sounds in their cognitive aspects; phonetics, which is the study of speech sounds in their physical aspects; morphology, which is the study of the formation of words; syntax, which is the study of the formation of

sentences; semantics, which is the study of meaning; and pragmatics, which is the study of meaning in context. Therefore, linguistics is the systematic study of the structure and evolution of human language, focusing on theories of language structure and language variation and use.

Phonetics, which this research focuses on, is the study of the sounds of speech. Phonetics is a branch of phonological study concerning the sound of a language regardless of whether the sounds have a function of differentiating meaning or not (McMahon, 2002). Phonetics includes understanding how sounds are made using the mouth, nose, teeth and tongue, and also understanding how the ear hears those sounds and can tell them apart. A study of phonetics involves practicing producing sounds, and figuring out which sound is heard. The waveform of each sound can be analyzed with the help of computer programs.

The study of phonetics has three aspects: acoustic phonetics, auditory phonetics, and articulatory phonetics (Bussman, 2006). Acoustic phonetics is the study of acoustic characteristics of speech, including analysis and description of speech. Auditory phonetics is the study of physiological processes involved in the reception of speech. Articulatory phonetics studies how the sounds of speech are made with the organs of the vocal tract.

This research used the computer software, Praat, to analyze the waveforms of sounds. Praat is a free, open-software tool, available for most desktop platforms. Praat is used for the analysis of speech in phonetics. It was designed and initially released in 1991 by Paul Boersma and David Weenink of the University of Amsterdam.

This research utilized acoustic phonetics as a subfield of phonetics, dealing with the physical properties of speech. Acoustic phonetics aims to analyze sound wave signals which occur within speech through varying frequencies, amplitudes, and durations. Acoustic phonetics investigates such features to abstract linguistic concepts such as phonemes, phrases or utterances. Pressure changes can be plotted on a waveform, which highlights the air particles being compressed and rarefied, creating sound waves that spread outwards. A tuning fork being struck is an example of the pressure fluctuations in the air and how the air particles oscillate when sound is perceived.

This study also applied articulatory phonetics which deals with the parts of speech which produce sound. According to Ogden (2009), the production of speech involves 3 processes: initiation, which sets air in motion through the vocal tract; phonation, which modifies airflow as it passes through the larynx (related to voicing); and articulation, which shapes airflow to generate particular sound types (related to manner.) There are consonants and vowels in articulatory phonetics. Consonants are divided into three areas, each combined together in the production of speech while vowels are made with the free passage of airflow without friction.

Learning articulatory phonetics develops the knowledge necessary to have good pronunciation. Each phoneme in words distinguishes one word from another since the way it is pronounced is essential in speech. For example in words "bag – /bæg/" and "beg - /bɛg/".The difference is only /æ/ and /ɛ/, yet they have very different meanings, therefore using articulatory phonetics it can be concluded that the sound does affect the meaning. With acoustic phonetics, meaningful differences between phonemes, syllables, or words can be separated as some aspects of speech can be properly defined in acoustic terms.

There are some previous researches that talk about phonetics and Praat. Al-Hamzi et al. (2021) in Pronunciation Errors of English Front Vowels by Yemeni EFL Learners revealed that Yemeni EFL learners' pronunciation of English front vowels, i.e. /i /, /I/, /Ɛ/ and /ae/ differs from those produced by native English speakers. It was also revealed that Yemeni EFL learners are still struggling in articulating English front vowel sounds due to the influence of the sound system of their native language that causes such pronunciation problems in the target language. The gap and differences between this research is that the research conducted by Al-Hamzi (2021) only used front vowels to show differences in pronunciation between the subjects and native speakers, while this research uses all monophthong and diphthong vowels. The research conducted by Al-Hamzi also only depicts the causes of errors from the subjects and

does not provide methods on how to mitigate or reduce errors made by the subjects as is done in this research. Rahmatunisa and Syarifudin (2021) in The Use of Praat in Learning English Debate in Indonesian EFL Classroom found that the use of intonation and stress can affect the meaning of speech, especially in debate. Their study helps the researcher to understand more about speech analysis using Praat. The differences between their study and this study are the research problems, methodology, and object of the research. Their study attempted to analyze how suprasegmental sound elements in English, namely stress and intonation can be analyzed using Praat and to describe how students of Universitas Kuningan perceive the usefulness of the software. The researcher uses Praat to analyze the stress and intonation patterns and a questionnaire to determine students' perception of Praat. Meanwhile, this research attempts to distinguish the errors Chinese Indonesian students made in pronouncing English vowels and analyzes their recordings using Praat software, and describes the factors which cause them to make errors. Maulana (2018) researched a similar issue in An Analysis Of Error In Pronouncing English Phonemes: A Case Study. The research shows that the participants each made the most inaccurate pronunciation when pronouncing /aʊ/ and /ə/, and that the main cause of their errors is the lack of interaction with a native speaker in the participants' learning activities. They did not talk about how to improve pronunciation or overcome pronunciation errors. This research talks about the method how to overcome errors and improve the value of pronunciation.

In Indonesia, there are various ethnic groups, one of which is the Chinese. People of Chinese descent live in various parts of Indonesia, including in Medan. In Medan, the Chinese Indonesians usually use Hokkien as the main language in their daily life, especially when interacting with other Chinese Indonesians. In addition, they also speak Indonesian daily. This mixing of various languages, especially Hokkien, affects Chinese Indonesians' pronunciation in speaking English. Therefore, for that reason, this research uses four students, consisting of two male students and two female students, who are Chinese Indonesians as the sample. These students, who are from the English department, have studied and passed the Phonology subject, therefore they are supposed to know how to properly and correctly pronounce English phonemes. While so, there is still a possibility that they pronounce English phonemes differently compared to a native speaker's pronunciation because of the influence of their mother tongue: Hokkien

The purpose of this research is to find the acoustic features and the reason for the error made by Chinese Indonesian students in pronouncing English vowels. The acoustic features were analyzed using acoustic phonetics through Praat software, while the reason for the error is analyzed using Richard's (1971) in theory about the cause of errors in pronunciation as cited in Ellis (1994). This study also aims to overcome the errors made by Chinese Indonesian students by using the Phonetic Transcriptions and Repetition method. Moreover, this study also aims to help students understand the differences between Chinese Indonesian students' pronunciation and native speakers' pronunciation. The researcher generates some research questions to this study:

1. How are the acoustic features of Chinese Indonesian students in pronouncing English vowels compared to the features of the English native speaker?
2. Why do Chinese Indonesian students produce errors in pronouncing English vowels?
3. How to overcome the errors made by Chinese Indonesian students in pronouncing English vowels?

2. LITERATURE REVIEW

2.1 Acoustic Phonetics

Yule (2010) describes acoustic phonetics as dealing with the physical properties of speech as sound waves in the air. It concerns the physical properties of speech sound as transmitted from mouth to ear, according to the principles of acoustics. Acoustic phonetics analysis provides the physical facts of utterance. Therefore, acoustic analysis is the evidence needed when analyzing either articulatory or auditory phonetics. Bussmann (2006) defines acoustic phonetics as a branch of general phonetics

investigating the physical properties of the acoustic structure of speech sounds according to frequency (pitch), quantity (duration), and intensity (spectrum).

2.2 English Vowels

Vowels are created using the air stream that flows with no obstruction in the mouth, pharyngeal, and nasal cavities. English vowels are divided into two groups: monophthongs and diphthongs.

Monophthongs are vowels that are almost unchanging. Because of this unchanging nature, monophthongs are also known as pure or stable vowels, such as: /ɪ/, /e/, /æ/, /ɒ/, /ʊ/, /ʌ/, /ə/, /iː/, /uː/, /ɑː/, /ɔː/, /ɜː/. These vowels are divided into two groups: short vowels [ɪ e æ ɒ ʊ ʌ ə] and long vowels [iː uː ɑː ɔː ɜː]. In the pronunciation of diphthongs, the organs of speech glide from one vowel to another within one syllable, such as: /eɪ/, /aɪ/, /ɔɪ/, /ɪə/, /eə/, /ʊə/, /əʊ/, /aʊ/. In terms of length, diphthongs are similar to long vowels. They both have two vowels that glide from the first part to the second part. The first part is longer and stronger than the second part, the loudness of the sound decreases as the glide happens.

2.3 Cause of Pronunciation Errors

According to Richards (1971), as cited in Ellis (1994), there are three causes of pronunciation errors. The causes are interference, intralingual and developmental errors. Interference error is the result of students' interlanguage that is influenced by another language, namely the students' mother tongue. The student's pronunciation is also affected by their mother tongue because of the dialect, accent, and similarities in pronouncing a word. Intralingual error is the result of the students' generalization. The students believe that all of the English phonemes have the same pronunciation in every word. Developmental error is the result of the student's lack of interlanguage knowledge. The students correct themselves, yet the correction is still not accurate.

2.4 Phonetic Transcription

There are actually a lot of methods or techniques to teach pronunciation. One of them is by using the phonetic transcription. Phonetic transcription is a system used for the written notation of spoken language (Hadumod, 2004). Phonetic transcription is a method of writing down speech sounds in a systematic and consistent way, also known as a 'notation' or 'script' (Major & Crystal, 1992). The statements above clearly show that phonetic transcription relates to written notation and spoken language. It means that written notation can be used to help learners how to speak the language correctly. Gimson (1964), as quoted by Morris-Wilson (2003), has suggested that phonemic transcription is a good method to reinforce analytically the information which the learner may have received imperfectly by ear. Indeed, the transcriptions might provide a good aid to correct misperceptions.

2.5 Repetition Method

Repetition drills are used for familiarizing students quickly with a specific pronunciation. The repetition drill is the simplest drill used in learning language patterns. Language learners merely repeat what the Native speaker says or the tape recorder produces. This may be used for the presentation of new vocabulary and will be useful for pronunciation class. Furthermore, at its simplest, drilling means listening to the model, provided by the teacher, or a tape or another student in the classroom, and repeating what is heard. It is also called a repetition drill. In a repetition drill, the source, such as the teacher, a Native speaker, or a tape recorder, says the model (words and phrases) and the students repeat it (Tice, 2004). Drilling can provide for a focus on accuracy. Increasing accuracy, fluency, and complexity is a way where a learner's language improves so there is a need to focus on accuracy at certain stages of the lesson or during certain task types. Provide learners with intensive practice in hearing and saying particular word phrases. Drilling can help learners get their tongues around difficult sounds or help them imitate intonation that may be rather different from that of their mother tongue.

2.6 Praat

Praat is an open-software tool used to analyze speech in phonetics studies. It was designed and continues to be developed, by Paul Boersma and David Weenink of the University of Amsterdam. It is free and available for most platforms. This software can generate waveforms, wide and narrow band spectrograms, intensity contour and pitch tracks, make recordings, edit a recorded sound, extract individual sounds for further analysis, and get information about pitch, intensity, formants, and pulses. Praat works much like a spectrograph, which is a machine with electric filters that acoustically analyze (speech) sounds for their frequency, intensity, and quantity (Bussmann, 2006). We can also enhance certain frequency regions, and segment and label words, syllables, or individual phonemes. The work can then be put in graphics for printing. For this research, the newest version of Praat is used, which is the 6.1.55 version, updated on 25 October 2021. This update provides safeguards against the program crashing on Windows operating systems and new phonetic symbols, which is a new backslash trigraph for a mid-centralized diacritic. Praat is necessary in this study for analyzing the individual phonemes and comparing the phonemes as pronounced by the samples to the ones pronounced by the native speaker.

3. RESEARCH METHODOLOGY

The students majoring in the English Department of the University of Sumatera Utara who have taken and passed the Phonology subject were chosen as the samples of this study. The samples were of Chinese descent and use Hokkien as one of their daily languages. There were four samples chosen for this study out of the eight total population of Chinese Indonesian students in the English Department ranging from the batch 2018 to 2020. The data of this research were the recorded sounds from the samples and the native speakers. The native speakers consisted of male and female native speakers since the samples also consisted of males and females. NS1 is the male native speaker, whose recordings were compared to S1 and S2, who is a male student. NS2 is the female native speaker, whose recordings were compared to S3 and S4, who are female students.

To find the errors, the students were given a list of English words to be pronounced. Each of the words had only one focused phoneme in it. The words were collected through Online Oxford Learner's Dictionary OPAL Written Words List. The OPAL List is the Oxford Phrasal Academic Lexicon, which provides an essential guide to the most important words to know in the field of English for Academic Purposes (EAP). The one focused phoneme from the words was the data to be analyzed further in Praat. To find the cause of pronunciation errors, the researcher built a questionnaire to investigate the causes of errors. The questionnaire is based on Richard's causes of errors. This questionnaire was then analyzed further in order to explain the cause of the error occurrences made by the samples in pronouncing English vowels. To overcome the errors and improve the values of the pronunciation, the samples were given the list again, this time with the phonetic transcriptions. This is done so that they read the phonetic transcription instead of the orthography. They were also given the Native speaker's recording so that the samples could listen to the correct pronunciation by the Native speaker in order to attempt to improve the errors they made in the previous recording. The samples were then asked to repeat their pronunciation three times. These recordings were then analyzed using Praat, then compared to the native speaker's recording and their own previous recordings to note the differences.

To deal with the problems of this research, the descriptive qualitative approach was employed. Moleong (2000) stated that qualitative research uses quantitative data, but such research is usually not followed by a quantitative analysis at the same time. Therefore, although this research used the qualitative method, quantitative data in the form of numerical information is used in this research to describe the frequency, quantity, and intensity of the pronunciation.

In collecting the data, this research employed the documentary technique through observation and interview techniques. The data, the documents in sound files, were collected using a computer. The reason this research used downloaded sound from the website Sound of Text, rather than from an actual native speaker is that it is more accessible, and the Sound of Text website recordings also have English

standard value of pronunciation. The data is then analyzed according to Miles, Huberman, and Saldaña (2014), there are three steps in analyzing the data: data collection, data Condensation, and drawing and verifying a conclusion.

4. FINDINGS

The researcher arranged the data of the reading task for the students. The data contained every English vowel phoneme in each word. Each phoneme was divided into three parts; beginning, middle, and ending. The researcher analyzed the data using Praat software. Native speakers were chosen to be the standard value of the pronunciation. The result of the analysis contains three aspects of the recordings: Frequency (Pitch), Quantity (Duration), and Intensity (Spectrum). For the figures of the analysis, the researcher grouped the phonemes into Short Vowels, Long Vowels, and Diphthongs.

Table: 1 Short Vowels words list

Short Vowel		
No	**Words**	**Phoneme**
1	Illustrate	/ɪ/
2	Analysis	
3	Semi	
4	End	/e/
5	Level	
6	Action	/æ/
7	National	
8	Would	/ʊ/
9	Unstable	/ʌ/
10	Number	
11	Ammonia	
12	Again	/ə/
13	Government	
14	Matter	
15	Opportunity	/ɒ/
16	Foreign	

Table: 2 Long Vowels words list

Long Vowel		
No	**Words**	**Phoneme**
1	Easy	/iː/
2	Reach	
3	See	
4	Earth	/ɜː/
5	Concern	
6	Occur	
7	Student	/uː/
8	Interview	
9	Argument	/ɑː/
10	Start	
11	Far	
12	Order	/ɔː/
13	Thought	
14	Law	

Table: 3 Diphthong words list

Diphthong		
No	**Words**	**Phoneme**
1	Time	**/aɪ/**
2	High	
3	Aid	**/eɪ/**
4	Accumulate	
5	Say	
6	Oil	**/ɔɪ/**
7	Exploit	
8	Employ	
9	Own	**/əʊ/**
10	Process	
11	Though	
12	Outcome	**/aʊ/**
13	Profound	
14	Now	
15	Eerie	**/ɪə/**
16	Realistic	
17	Mere	
18	Airline	**/eə/**
19	Therefore	
20	Fair	
21	Individual	**/ʊə/**
22	Ensure	

4.1 Pronunciation Values Comparison

After the recording of Chinese Indonesian students pronouncing English vowels was analyzed and compared to the recordings of the Native speakers, it was found that the samples produced errors in their pronunciation, namely in their Pitch, Intensity, and Duration. Therefore, to overcome these errors, the samples were given the same list of words; however, this time the phonetic transcriptions of the words were provided in order to assist the samples to correctly pronouncing the words. The samples were also given the Native speaker's recordings and were told to repeat the pronunciation three times.

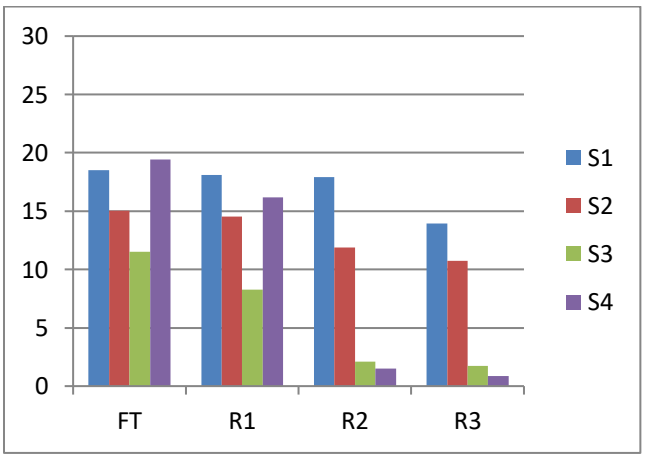
The section only used five words out of fifty-two words total, meaning that only 10% of the total words were used. Short vowels, long vowels, and diphthongs are all included in this section. The short vowels were represented by two phonemes, namely /ɪ/ in the word 'illustrate' and /e/ in the word 'end'. The long vowels were represented by two phonemes, /iː/ in the word 'easy' and /ɜː/ in the word 'Earth.' The diphthongs were represented by one phoneme, /aɪ/ in the word 'time.'

The samples' pronunciation values are shown by percentage. The smaller value means the closer the value to the native speaker's value. In the tables below, each value from the first trial to the first until the third repetition are shown in percentage. The range value is then shown for the contrast range between native speakers and samples.

Table: 4 Range Value

No	Words	Phoneme	Speaker	First Trial Range	Second Trial Range		
					Repetition 1	Repetition 2	Repetition 3
1	Illustrate	/ɪ/	S1	18.49%	18.09%	17.93%	13.05%
			S2	15.04%	14.54%	11.88%	10.75%
			S3	11.50%	8.26%	2.09%	1.71%
			S4	19.41%	16.19%	1.52%	0.87%
2	End	/e/	S1	30.47%	28.53%	24.91%	17.93%
			S2	23.18%	18.04%	17.11%	15.91%
			S3	23.34%	16.77%	15.50%	6.38%
			S4	19.11%	13.93%	6.01%	3.74%
3	Easy	/i:/	S1	23.00%	22.27%	21.03%	11.08%
			S2	11.89%	11.84%	9.01%	5.67%
			S3	29.28%	20.96%	19.06%	10.51%
			S4	32.48%	22.85%	10.84%	6.41%
4	Earth	/ɜ:/	S1	21.92%	20.54%	19.60%	15.88%
			S2	12.19%	11.23%	5.92%	2.08%
			S3	11.84%	10.43%	9.13%	3.26%
			S4	23.37%	17.60%	13.73%	12.80%
5	Time	/aɪ/	S1	8.62%	2.15%	1.55%	0.48%
			S2	23.77%	11.41%	5.29%	2.25%
			S3	13.64%	6.04%	5.21%	3.65%
			S4	18.02%	11.65%	10.18%	1.32%

Figure:1Range Value of Phoneme "/ɪ/" in word "Illustrate



The table and figure above show the percentage values of the samples' repetitions from the first repetition to the third repetition in pronouncing selected phonemes. The first repetition shows an improvement in the range from the samples' previous pronunciation before they were given the phonetics transcription and repetition. The second repetition shows an improvement in range compared to the first repetition. Finally, the third repetition shows an improvement in range compared to all of the samples' previous pronunciation. The range in the third repetition is the closest value that the samples can achieve to that of the Native Speakers.

4.2 Cause of Errors

S1: Interference. It is the result of interlanguage influenced by another language, namely the mother tongue.
S2: Interlanguage and Developmental errors. Interlanguage error is the result of the language learner's generalization. The learners believe that all English phonemes have the same pronunciation in every word. Developmental error is a lack of interlanguage knowledge. The language learner made the correction but the correction is still inaccurate.
S3: Interference and Developmental error. Interference is the result of interlanguage influenced by another language, namely the mother tongue. Developmental error is a lack of interlanguage knowledge. The language learner made the correction but the correction is still inaccurate.
S4: Interlanguage error. Interlanguage error is the result of the language learner's generalization. The learners believe that all English phonemes have the same pronunciation in every word.

5. DISCUSSION

After the data were analyzed, it is found that there is an improvement in the samples' pronunciations of English vowels. The findings show the Range percentage from their first pronunciation to their third repetition of each sample, pronouncing the phonemes /ɪ/ in the word 'illustrate,' /e/ in the word 'end', /iː/ in the word easy, /ɜː/ in the word 'Earth,' and /aɪ/ in the word 'time.' This result is identical to the research findings of Ganie (2019) who investigated errors made by Acenese students in pronouncing English phonemes. The study also used Praat as the instrument of the result in analyzing the data. The results show that no participants or subjects pronounce English phonemes correctly or have 0% range value. This study has the same results as Ganie (2019), there is no subject who has the same value as a native speaker. This result reduced the scope which only focus on the vowels and give methods on how to improve the subject's pronunciation or reduce the error made by the subjects. Finally this research success in developing Ganie (2019) research which only shows the errors and the range gap between subjects and native speakers. This research develops it by improving the quality of subject pronunciation so that the value is closer to the standard value.

In pronouncing the phoneme /ɪ/ in the word 'illustrate,' S1 showed an improvement in Range from 18.49% to 13.05%; S2 showed an improvement in Range from 15.04% to 10.75%; S3 showed an improvement in Range from 11.50% to 1.71%; S4 showed an improvement in Range from 19.41% to 0.87%. In pronouncing the phoneme /e/ in the word 'end,' S1 showed an improvement in Range from 30.47% to 17.93%; S2 showed an improvement in Range from 23.18% to 15.91%; S3 showed an improvement in Range from 23.34% to 6.38%; S4 showed an improvement in Range from 19.11% to 3.74%.

In pronouncing the phoneme /iː/ in the word 'easy,' S1 showed an improvement in Range from 23.00% to 11.08%; S2 showed an improvement in Range from 11.89% to 5.67%; S3 showed an improvement in Range from 29.28% to 10.51%; S4 showed an improvement in Range from 32.48% to 6.41%. In pronouncing the phoneme /ɜː/ in the word 'Earth,' S1 showed an improvement in Range from 21.92% to 15.88%; S2 showed an improvement in Range from 12.19% to 2.08%; S3 showed an improvement in Range from 11.84% to 3.26%; S4 showed an improvement in Range from 23.37% to 12.80%.

In pronouncing the phoneme /aɪ/ in the word 'time,' S1 showed an improvement in Range from 8.62% to 0.48%; S2 showed an improvement in Range from 23.77% to 2.25%; S3 showed an improvement in Range from 13.64% to 3.65%; S4 showed an improvement in Range from 18.02% to 1.32%.

In pronouncing the phoneme /ɪ/ in the word 'illustrate,' S4 showed the closest Range to the Native Speaker with a 0.87% value. In pronouncing the phoneme /e/ in the word 'end,' S4 also showed the closest Range to the Native Speaker with a 3.47% value. In pronouncing the phoneme /iː/ in the word

'easy,' S4 again showed the closest Range to the Native Speaker with a 6.41% value. In pronouncing the phoneme /ɜ:/ in the word 'Earth,' S2 showed the closest Range to the Native Speaker with a 2.08% value. In pronouncing the phoneme /aɪ/ in the word 'time,' S1 showed the closest Range to the Native Speaker with a 0.48% value.

The samples chose the causes of their errors according to their own opinion. S1 answered that the cause of his error is Interference, meaning that S1 thought that the influence of his mother tongue results in fossilization and therefore causes errors in his pronunciation of English as a second language. S2 answered that the causes of his error are Intralingual and Developmental errors. S2 thought that his over-generalization of pronouncing English words and a lack of interlanguage knowledge may be the cause of the error in his pronunciation of English. S3 answered that the reason for their error may be because of Interference and Developmental error: the influence of her mother tongue results in fossilization and a lack of interlanguage knowledge cause her errors. S4 answered that the Intralingual error is the cause of her pronunciation error, meaning that S4 thought that her over-generalization in pronouncing English phonemes causes her pronunciation error.

6. CONCLUSION

After the data were analyzed, it is found that none of the samples pronounce each phoneme exactly in 100% mean value or 0% range value. In comparing the pronunciation, the value of the samples' Pitch, Intensity, and Duration are taken from Praat, and the value of each phoneme is then summed up and divided by three to find the average value. The average value of the correct pronounced phoneme is 100%. It is concluded that the samples produce an error in their English vowels pronunciation, as seen through their recordings which show an average value of less than 100% or more than 100%, none show a 100% match with the Native Speaker's value. Based on the samples' answers to the questionnaire, all three of Richard's causes of errors are present in the samples. Interference becomes the cause of errors for S1 and S3, Intralingual error becomes the cause of errors for S2 and S4, while Developmental error becomes the cause of errors for S2 and S3.

Since none of the samples' pronunciation recordings match the Native Speaker's recording 100%, that is, the samples produce either lower or higher values than the Native Speakers' values; the Phonetic Transcription and Repetition methods were used in an attempt to improve the samples' pronunciation of English vowels. It is found that there is an improvement in the samples' pronunciations of English vowels. The improvement of the Range percentage is shown from their first pronunciation to their third repetition of each sample.

It can be concluded that the Phonetics Transcription method and Repetition drills can improve Chinese Indonesian students' English vowel pronunciation, as seen in the above description that all of the samples show an improvement from their first pronunciation to their third repetition in pronouncing selected English vowels.

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