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The Production of Interdental Fricatives by English as a Foreign Language Students in English Course Bandung

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ABSTRACT

Every language has its characteristics in the production of sound. When learning a new language, one probably encountered unfamiliar sounds. For EFL students in Indonesia, they will find it hard to pronounce interdental fricative sound like [θ] and [ð] because, in Indonesian pronunciation, there are no interdental fricative sounds. Therefore, the limited consonant sounds in Indonesian that is not similar become one of the barriers for the students to pronounce the words in English properly. For instance, the words that contain interdental fricative sounds in word-initial position as in 'this' and 'thin', medial as in 'father' and 'authority', and final part as in 'booth' and 'truth'. Based on this problem, this research attempts to find out and analyze the production of voiceless and voiced interdental fricatives by EFL students in Bandung using the help of software Praat (Boersma, 2001). The data were collected from four students with their voice recordings in pronouncing the words in English that contain an initial, medial and final position of interdental fricative. The result shows that the voiceless interdental fricative [θ] is produced as [d],[t],[tʰ] and elimination of [θ] sound, while the voiced interdental fricative sound [ð] is produced as [d], [t] sounds.

I. Introduction

Languages are varied with one and another, so as their system of sound. This becomes one of the trickiest things in learning a foreign language, pronunciation. The factor could be the unavailability sound system in the student's native language or the phonological mismatch between the student's native language and the target language [1]. Therefore, if student's L1 has no existing vowel or consonant sound in L2, they are unable to simply skip the phoneme that is hard to pronounce. The strategy they use to produce these sounds is to substitute the L2 sound with their closest L1 sound. This kind of contrast for students who learn English as a foreign language will be one of the language barriers when they are speaking. Thus, in line with Graeppi & Leemann (2019), the substituted sound is typically acoustically the most similar sound in the students' L1 to one from the target language.

Indonesian EFL students also face the same matter in pronouncing the English consonants. According to Komariah (2019) and Rustipa (2009), Indonesian EFL students' find it difficult to pronounce certain of consonant sounds, fricatives are one of the difficulties /θ, ð/, /ʃ,ʒ/. In this case of the research, the students are having difficulties in pronouncing the interdental fricatives sound /θ, ð/. They have no idea when to produce /θ/ sound and /ð/ in certain words that consist of interdental fricatives like *th*in and *th*e.

The English interdental fricatives are represented by two different phonemes which are [t] and [d]. The friction in /θ/ is voiceless, whereas for /ð/ is voiced interdental fricative because there is some vocal cord vibration [5]. Fricatives involve an obstruction that occurs in the vocal tract to produce frication. In addition, the duration of the frication noise voiceless fricatives is much greater than voiced fricatives, this is what it makes the distinction from voiceless and voiced interdental fricatives [6].

However, the productions of these English consonants are not always successful at the beginning, because of the different sound system of a language of EFL students. Previous research showed that the Turkish speaker unable to pronounce interdental consonant phonemes which lead the emergence of fossilized pronounciation errors because of the non-existent sound system in the Turkish language [7]. Another research conducted by Bui (2016) found out that students in Vietnam were encountered the problem in pronouncing the words that contain /θ/ and /ð/ sounds in English words. In Vietnam, they tend to replace the voiced interdental fricative with /z/ sound. Not only that, but also the result shows the tendency to pronounce /dʒ/ rather than /ð/. Moreover, the voiced interdental fricative is harder to pronounce for students' in Vietnam. Another research about interdental fricative was conducted by Hanulíková & Weber (2010) shows that the pronunciations by German students and Dutch students in pronouncing the interdental fricative sounds. The result shows that the dominant substitution for [θ] sound for German students is [s], different from Dutch students, they tend to substitute that with [t]. These substitution process in producing the target sound are actually create a pattern that employed by the speakers [10].

However, these previous research analyses are on the level of categorizing the difficulties faced by the EFL students. Meanwhile, this study aims 1) to analyze what kind of production that EFL students create in pronouncing the voiced interdental fricative and voiceless interdental fricative 2) to describe and analyze the sound production spectrogram by students in pronouncing the interdental fricative sounds using the Praat application. Analyzing sound through spectrogram provides a clearer visual of the sound produced by the students, therefore, the different sounds produced by the students and the natives can be contrasted.

II. Method

Qualitative research has the natural setting as the direct source of data and the researcher is the key instrument (Bogdan, R. C.; Biklen (1982). Therefore, descriptive qualitative is applied in this study. The main focus of the study is collecting, compiling, categorizing, understanding, and interpreting data. To get an in-depth understanding of students' production in pronouncing interdental fricatives, the case study method is applied in this study [12]

The respondents of this study were four EFL students from an English Course in Bandung. These students have never taken any pronunciation classes. As a result, the sounds they produced were their pure productions because they were not taught first how to pronounce /th/ sound in the first place. The technique of data collection in conducting this research is by collecting the students' voice recordings of English words with interdental fricatives sound. In this step, the students were asked to read the 18 words which provided in a wordlist without any pressure. The words composed of interdental fricatives consonant (both voiced and voiceless interdental fricative) that occurred at three positions; the initial, medial, and final positions.

After collecting the data, the next step is analyzing the data. In data analysis, the students' voice recordings were analyzed trough the Praat system [13] to see how the [θ] and [ð] were produced. It can be seen from the spectrogram of the sound which displayed by the Praat system. There some steps in analyzing the data of this research. The first step is to determine how is the students' production of [θ] and [ð] sound in English. The second step is to analyze the spectrogram of students' voice recording in Praat system, to see how are the interdental fricatives spectrogram look like in initial, medial, and final position. In the data display, the analyzed spectrogram of the students are arranged to present the data. Graphics, charts, and tables help the data collected to be more organized and easy to be described [14]. In this research, the analyzed and classified data is displayed on graphics and table form. The third step is to draw a conclusion from all of the results.

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III. Results and Discussion

A. *Voiced Interdental Fricative Data Distribution*

Data Distribution of students' production of voiced interdental sound is presented below:

Table 1. *Students' Production of Voiced Interdental Fricative*

Position	Voiced interdental Fricative	Production
Initial	That	[dat]
	This	[dis]
	Those	[dus],[dos], [θos], [dʌs]
Medial	leather	[lider], [liθer]
	mother	[mʌð.ər]
	weather	[weð.ər]
Final	with	[wɪθ]
	smooth	[smut]
	breathe	[briːde],[brith]

From Table1 it can be seen that most of the students are producing the [d] sound. The production of voiced interdental fricative [ð] in initial position mostly substituted with [d] sound in Indonesian. Since there is no word in Indonesian start with */th/* consonant, they replaced the unavailable consonant sound with the closest one to their consonant, which is the /d/ sound. As for the word-medial position they produce the sound [ð], because they are familiar with those words so there is no obstruction for them, unlike the other one (leather). Last, in word-final position, they do not produce the voiced interdental fricative as [d] sound, rather they produced the dental stop [t] sound in Indonesia. This happens because the common word they know is *the* which pronounce like [de], so they tend to generalize the initial word */th/* is pronounced [d]. In addition, their prior knowledge about how the sounds produce when the */th/* in final position is like the sound [t] in Indonesian, they also eliminate the /h/ sound in. In conclusion, mismatches happen in this analysis of consonant. Those are the factor that caused the EFL students to produce the closest sound they have in their L1 sound system. In other words, the interference of students L1 is supporting the substitution of their English pronunciation.

1. *Spectrogram of Voiced Interdental Fricative*

(a) Initial Position

From the comparison of spectrogram, it can be seen that there is no friction at all that occur in Figure 1 when student producing the word *'that',* instead there are only alveolar voiced /d/. The production of all fricatives is continuant [15]. Here the voiced fricatives are produced with simultaneous noise and voice sources [16].

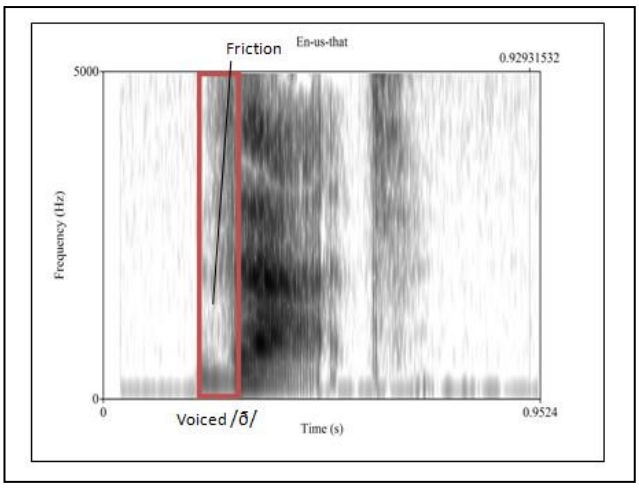

Fig. 1. *Production of "That" by the native*

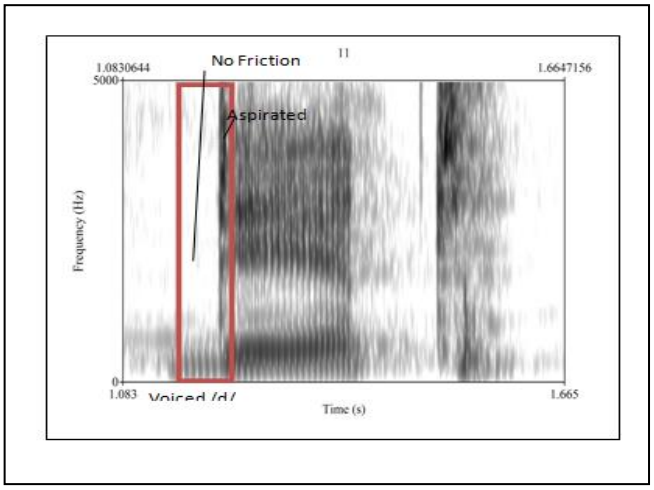

Fig. 2. *Production of "That" by the students*

(b) Medial Position

In medial position, the productions of voice interdental fricative /ð/ in word leather are [lider] and [liθer]. In the spectrogram that produced by students. It can be seen that the friction is less than the friction in voiced fricative. It is because the voiceless fricative does not need much energy to produce the sound, it is opposed to the voiced fricative. It can be seen in the following figures.

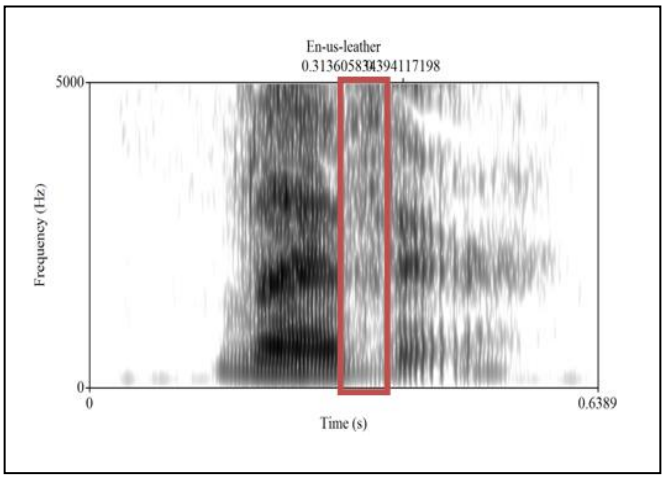

Fig. 3. *Production of "Leather" by the native*

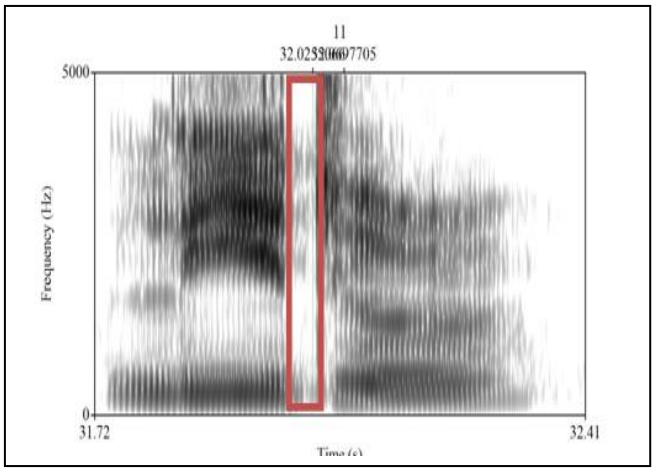

Fig. 4. *Production of "Leather" by students*

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(c) Final Position

In the final position, almost all of them produced the same dental stop [t] sound, which there is no fricative occurred, rather the [ð] sound. Most of them produce a stop and aspirated consonant, and it produces a longer closure than in /b,d,g/ consonant.

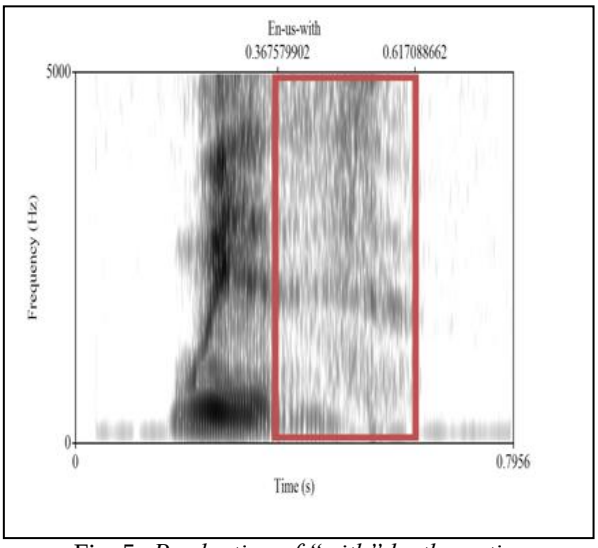

Fig. 5. *Production of "with" by the native*

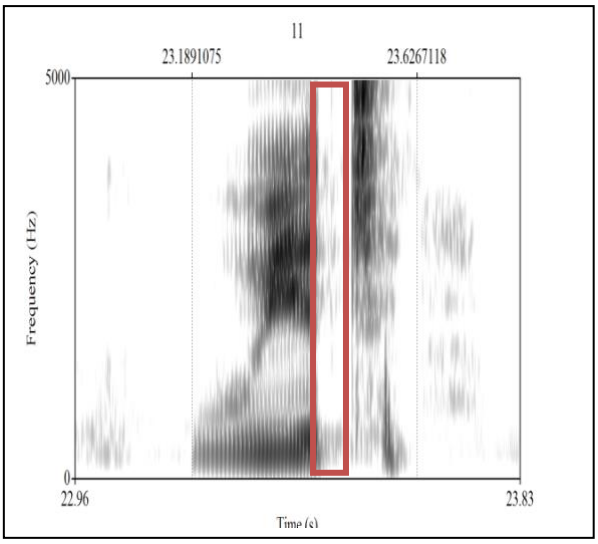

Fig. 6. *Production of "with" by the students*

B. Voiceless Interdental Fricative Data Distribution

Data distribution of students' production of voiceless interdental sound is presented below:

Table2. *Students' Production of Voiceless Interdental Fricative*

Position	Voiced interdental Fricative	Production
Initial	through	[trog], [trug],[tug]
	third	[tird,], [dird], [θɜ˞r:d]
	theory	[teori]
Medial	authority	[ɑutoriti]

	Authentic	[ɑuθen.tɪk],[ɑten.tɪk] [ɑuten.tɪk]
	birthday	[Britdeɪ],[bɜrt.deɪ],[bɜrd.deɪ]
Final	month	[mont], [mʌn]
	mouth	[mot], [mɑut]
	fourteenth	[Fourtint], [fourtin]

It can be seen from the data that the production they produced in pronouncing the [θ] sounds are [t], [d], and [θ]. In the word-initial position, they produced [t] rather than [θ]. The tendency in pronouncing the voiceless interdental fricatives are substituted the [θ] sound into [t] and eliminated the [h] sound. Not only that but also there is one student who produces the [d] sound in word-initial voiceless interdental fricative. While another one produces [d] sound in medial position in the word 'birthday'. This is because the */th/* sounds the same to him as [d] sound. The production of voiceless interdental fricative can occur with no substitution at all. In the word-final position, the production is eliminating all the *th* sound in the word 'month' become [mʌn] instead of [mʌnθ].

2. *Spectrogram of Voiceless Interdental Fricative*

(a) Initial Position

In the initial position, all of the four students are produced the [t] sound instead of [θ], except in the word 'third'. Students produce different sounds, the [d] and [θ] sound. In word-initial they tend to skip the [h] sound and jump into the next phoneme instead. In another word, they tend to eliminate the [h] sound and changed it into a plosive consonant [t] only so they did not produce the fricative sound. The spectrogram can be seen below:

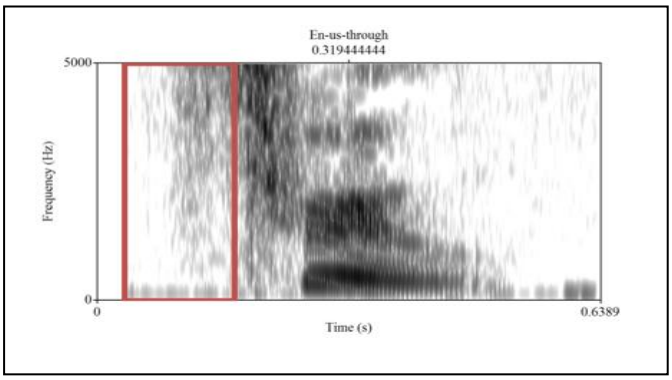

Fig. 7. *Production of "through" by the native*

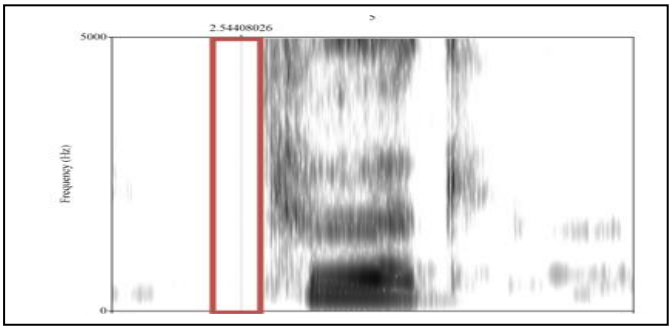

Fig. 8. *Production of "through" by the students*

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(b) Medial Position

Almost similar to the word-initial position, the production of [t] sound for [θ] is often occurs. There is another production although in a small number of [d] and [θ] sound. They share the same tendency when the student mentioned the word *authority* as [ɑutoriti], they substitute the voiceless interdental fricative into [t] sound instead.

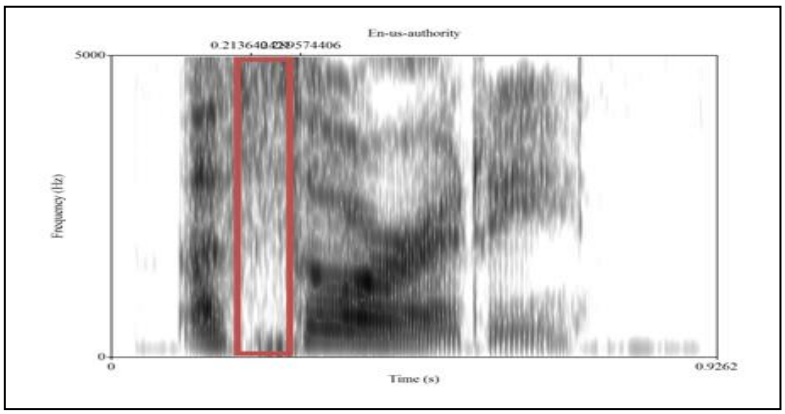

Fig. 9. *Production of "authority" by the native*

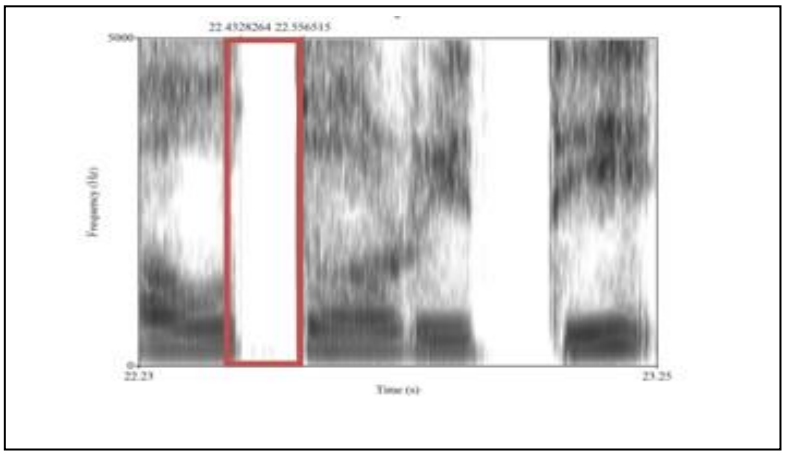

Fig. 10. *Production of "authority" by the students(1)*

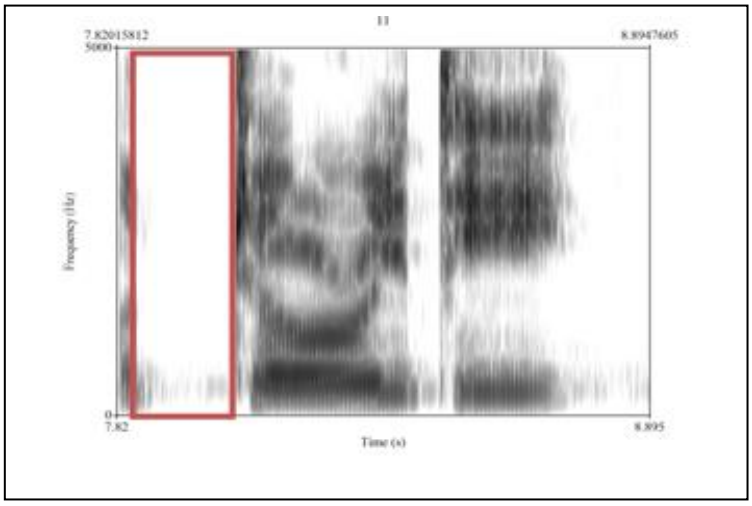

Fig. 11. *Production of "authority" by students (2)*

(c) Final Position

The tendency in the final position, the students did not produce the [d] sound here, but rather eliminates the [h] sound or just produced the [t] alone. Only one student that eliminates the [h] sound in *th* for two words. In the word 'month' they produce it as [mont] and [mʌn] instead [mʌnθ]. The similarities of production of another final position words are similar to the production in the word 'month'.

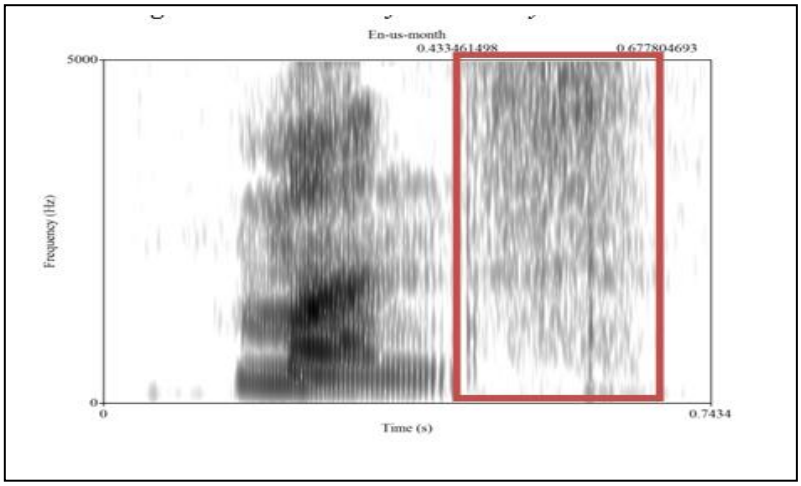

Fig. 12. *Production of "month" by the native*

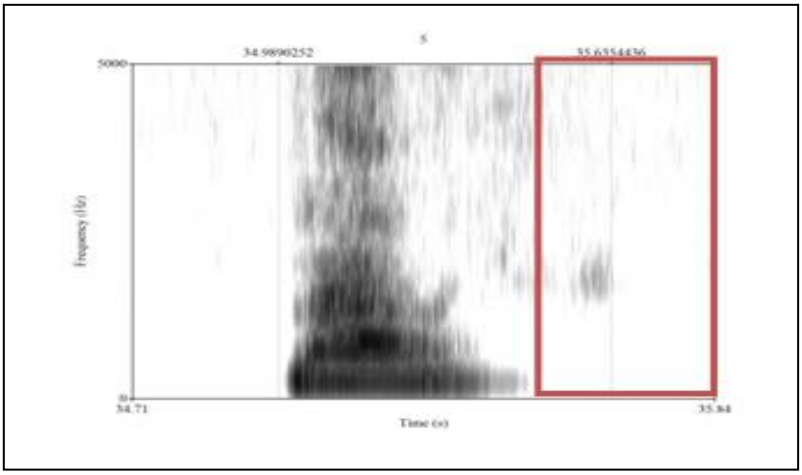

Fig. 13. *Production of "month" by the students*

IV. CONCLUSION

Learning a foreign language could be a challenge for some people especially for students. The production of one sound of a sound system like consonants could be different from one another. This study leads to the conclusion that the productions of EFL students in the English Course in Bandung are varied. Since the interdental fricative sounds are not available in the Indonesian pronunciation system, the mismatches occurred between Indonesian and English. The result shows that the voiceless interdental fricative [θ] is produced as [d],[t],[th] and elimination of [θ] sound, while the voiced interdental fricative sound [ð] is produced as [d], [t] sounds.

From the spectrogram analysis, it can be proved whether the students are pronouncing the fricatives sounds or not. Fricative sound or noise represented as the scribbly pattern in the Praat system. If one sound does not produce a scribbly pattern, it can be said that it is not a fricative sound.

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