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Using Praat for English Pronunciation Self-practice outside the Classroom: Strengths, Weaknesses, and its Application

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Abstract

Praat is a freeware program widely used by phoneticians for acoustic analyses of speech sounds, though less commonly so for pedagogical purposes. To our knowledge, no research on English pronunciation teaching has used Praat outside a classroom setting. In this article, we would like to report on a voluntary pronunciation-training project and discuss the extent to which Praat can promote self-regulating pronunciation practice beyond the classroom. Six Thai college learners with high aspirations to improve their pronunciation skills volunteered to participate in this training. In light of the small number of participants, we were unable to conduct in-depth research to examine extensively the effectiveness of using Praat outside the classroom. However, we have gained hands-on experience from undertaking this training project, and therefore would like to share with readers how an instructor can use the Praat program to help their learners improve their pronunciation.

	We also discuss the strengths and weaknesses of using Praat beyond the classroom setting and highlight the roles of the instructor in assisting learners to reach their pronunciation goals.

1. Introduction

In teaching English pronunciation, modern technological tools have played a significant role in classroom instruction. There are many pronunciation software packages and websites that can be used for practice in class as well as autonomously by learners outside class; these include Clear Pronunciation 2, Pronunciation Power 2, Rosetta, CPRs WaveSurfer, Transcriber, MyET, Tell Me More, Issues in English, ASR, and others. Many research studies have proved the effectiveness of these tools (Lee, 2008 on MyET and Issues in English; Thumawongsa & Getkham, 2015 on Phonetic Flash Animation Guide PFAG, for example).

Two obvious advantages of software programs designed for English pronunciation practice is that they are "edutaining" and user-friendly. Unfortunately, a good product usually comes with a cost, and not every university values an investment in pronunciation software, even if they have a sufficient budget. The Praat software program, on the other hand, is free. It is widely used by phoneticians in analyzing speech sounds acoustically. The software was created in 1995 by Professors Paul Boersma and David Weenik from the University of Amsterdam (Boersma & Heuven, 2001).

In Thailand, Praat is commonly used among linguists, phoneticians, and dialectologists, but not among English as a foreign language (EFL) practitioners. The infrequent use of Praat in the EFL classroom setting, despite its free access, may be because it was primarily designed for the detailed acoustic analysis of speech sounds (Boersma & Heuven, 2001). Nevertheless, Praat has proven to be effective for second language learners who wish to improve their English pronunciation.

The successful application of Praat in EFL classrooms has been shown in Italy (Brett, 2004), Japan (Wilson, 2008), Korea (Yoon, 2007), Hawaii–USA (Le & Brook, 2011), Iran (Gorjian et al., 2013), Algeria (Hamlaoui & Bengrait, 2016), and Indonesia (Triassanti, 2015). Some of these researchers conducted their studies in their Phonetics classes. In our context (Thailand), however, English pronunciation practice plays a minor role in English classes (Sahatsathatsana, 2017), and not every instructor

prioritizes pronunciation activities in class. With the limited opportunity to practice pronunciation skills in classrooms, we think that instructors should find ways to help learners manage their own pronunciation practice independently outside the classroom. This is how we first conceptualized our English pronunciation training project.

In this article, we describe the procedures of training as well as investigate the problems and obstacles that our learners faced when using Praat. We then outline the lessons learned from the training so that readers can apply Praat to their English-learning activities either within or outside the classroom.

2. Literature Review

According to Celce-Murcia et al. (1996), pronunciation teaching has taken a communicative approach since the 1980s, based on the view that the main purpose of language use is to be able to communicate with others. The teaching tools for pronunciation/speaking classes could be seen as task/activity-based and computer-assisted. In task/activity-based approaches, several written and oral discourses were used as teaching tools, such as Ted Talk speeches (McGregor et al., 2016), aesthetic texts—i.e., songs, poems, and actors' lines (Hu, 2017), digital storytelling (Somdee & Suksan, 2013), and reading aloud (Adrian, 2014). In a computer-assisted approach known as Computer-assisted Pronunciation Teaching (CAPT), many commercial software programs have been used to help improve learners' pronunciation, and there are numerous studies that prove the benefits of using tools such as Clear Pronunciation 2 (Khoshima et al., 2017) and Pronunciation Power (Liu, 2008). Praat, on the other hand, is a non-commercial freeware program. Boersma and Heuven (2001, p. 347) stated that Praat "is a formidable research and teaching tool for phonetics", but also warned that "Praat is not unlike the magic broom that takes off with the sorcerer's apprentice" (p. 345). The general advice would be: "do not try this at home, and always consult your local phonetician" (Boersma & Heuven, 2001, p. 345). Despite this caveat, Praat has been applied as a tool to improve English pronunciation by a number of English language practitioners.

Brett (2004) used Praat with tertiary level Italian learners for the practice of English vowel production. Brett admitted that learners must acquire some basic concepts of articulatory phonetics in order to be able

to gain benefits from using Praat. To reduce the complicated procedure when using the Praat program, he created user-friendly software called Macromedia Flash MX as an interface; the software shows phonemic transcriptions of the vowel models in the vowel chart.

The following year, Wilson (2008, p. 33) posited that "Praat can be used for more than simply plotting formants" and proposed other applications based on measurements of duration, pitch, and intensity, in particular the distinctions of English /l/, /r/, and Japanese /r/. The acoustic distinction between the middle /l/ and /r/ in a pair of "healing" and "hearing" lies in the 3rd formant (F3). F3 of /l/ "healing" lowers whereas F3 of the latter word remains high. The spectrogram produced by Pratt helped the Japanese learners in his study identify the /l/ and /r/ distinction.

Following this, Yoon (2007) demonstrated how to mix the learner's voice with some acoustic features extracted from a native English speaker's voice: a technique he called "cloning prosody". The outcome of this prosody-cloning technique was the learner's manipulated word/sentence utterances sounded like native English speakers. Yoon concluded that this technique could boost a learner's motivation as they heard their own voice with an improved quality of pronunciation.

In Iran, Gorjian et al (2013) investigated the effectiveness of Praat on learners' English pronunciation by conducting an experiment on two English classrooms focusing on stress and intonation; one class was the control group taught using a traditional approach, whilst the other was the experimental group, who were given lectures on stress and intonation plus an opportunity to use Praat. The findings indicated that the experimental group outperformed the control group, as evidenced by the post-test scores. However, the result was perhaps to be expected because the experimental group received extra care.

In another study, Hamlaoui and Bengrait (2016) examined to what extent Algerian learners could improve the intonation of wh-questions and tag questions by means of an audio-visual software program. BetterAccent Tutor and Praat were the two Computer-Assisted Language Learning (CALL) software programs used with the experimental group. The control group, meanwhile, was taught via a traditional method, whereby learners repeated the sentences they heard. In their findings, the experimental group outperformed the control group on post-tests of intonation pronunciation. Given that the control group was provided with auditory feedback only, while the experimental group was provided with a better

understanding of their pronunciation, the findings, again, are somewhat unsurprising.

In a similar study, Le and Brook (2011) taught a low-intermediate class of six EFL learners for four weeks, focusing on stress and intonation of yes/no and wh- questions. The researchers showed the learners how to record their own voices in Praat and interpret the pitch display on the screen in comparison with the same tokens uttered by English native speakers. The results indicated that some, if not all, learners improved the pronunciation of yes/no and wh- questions significantly; however, they admit that the number of learners was a limitation of their study.

Other studies have shown similar improvements in learner performance but are also lacking when it comes to their methods. Triassanti (2015), for instance, trained 30 Indonesian learners to examine their word stress patterns in Praat. And although she also reported pronunciation improvement, there are no details on how the data was collected and analyzed.

Despite the benefits of using Praat in EFL classroom settings claimed in the aforementioned studies, we did not find any work that alluded to the application of Praat for pedagogical purposes in Thailand. This non-application of Praat in English classrooms in Thailand may be due to a lack of collaboration between linguists and English-language instructors, although this is solely our speculation.

Isaacs and Trofimovich (2017) stated that pronunciation is an interdisciplinary approach to many related linguistic studies, including second language pedagogy. Gordon et al. (2013) proposed that explicit phonetic instruction has proven to be an effective method for pronunciation teaching. In Thai pedagogical contexts, pronunciation is usually embedded in English courses (Tassev & Sojisirikul, 2017) or in English phonetics classes (Sahatsathatsana, 2017). And although there are a few studies which address the problems of Thai learners' English speaking skills (Boonkit, 2010; Noom-ura, 2013; Somdee & Suksan, 2013), these do not state clearly to what extent their speaking class was related to pronunciation teaching.

Phonetically, stress and pitch have been proposed as the most salient features in spoken English (Jenkins, 2000; Derwing & Rossiter, 2003; Kang, 2012). Praat's function on pitch movement and stress is very straightforward. We believe that the use of Praat together with explicit

instruction of suprasegmental features (pitch, stress, and intonation) would bring great benefits to learners who want to practice on their own.

Our aim in starting this training project independently from our institutions' English curriculum has been strongly influenced by the broad concept of Learner Autonomy as proposed by Holec in 1981. He coined it as "the ability to take charge of one's own learning" (Holec, 1981, p. 3). Pronunciation practice should be done autonomously, as it is an aspect of foreign language teaching that has not been emphasized in the classroom setting (Pawlak & Szyszka 2018). Different educationalists and practitioners used this term interchangeably with other notions like self-instruction, self-regulation, independent learning, or self-study. However, we take the same stance as Masouleh and Jooneghani (2012) who posited that "autonomy is not a synonym for self-instruction. It is not limited to learning without a teacher" (Masouleh & Jooneghani, 2012, p. 837).

Benson (2008) pointed out that learning in class and learning from learners' daily life are a "complex social arrangement" (Benson, 2008, p. 2) that cannot be clearly separated. He further posited that in learning beyond the classroom, two notions need to be considered: the setting and the mode of practice. Setting refers to "a particular kind of arrangement for learning involving one or more learners in a particular kind of place, and situated in particular kinds of physical, social, or instructional relationships with others (instructors, learners, and others)" (Benson, 2008, p. 5). Mode of practice, on the other hand, means "a typical set of routine processes or interactions that deploy the elements of a particular type of setting and are characteristic of it." (Benson, 2008, p. 6). In our view, we interpret the setting as the *who*, *what*, *when*, and *where*: who are the learners? What are the subjects or the contents to be learned? When or how long would the learning process take? And where does the learning take place? On the other hand, the mode of practice is deemed as the how: how do learners and instructors interact in such and such a setting? How do learners go through the learning process? One setting may support and interact with different modes of practice; as a result, one should not limit studies to the classroom setting, as language learning could take place in daily life beyond the classroom as well.

Dam (2008) listed the characteristics of an autonomous learner as a person who can (a) set clear aims and purposes for themselves, (b) select methods that are appropriate for those aims, (c) organize and perform the tasks, and (d) choose methods to evaluate their own achievements. Nunan

(2003) suggested a nine-step program towards learner autonomy, which aligns with the behavior of an autonomous learner as outlined by Dam's description above. These steps are for instructors and are as follows:

1. Make sure that learners explicitly understand the goals of instruction;
2. Give opportunities for learners to set their own goals;
3. Encourage learners to use their target language outside the classroom;
4. Be explicit about the strategies you use in class;
5. Allow them to use strategies to learn according to their preference;
6. Provide learners with choices as much as possible;
7. Encourage learners to implement their own tasks;
8. Collapsing with (9) encourage learners to become instructors and researchers.

In terms of the teacher's role, Dam (2008) outlined four aspects essential for the teacher. First, instructors should inform learners clearly about the requirements, demands, and expectations for the class. Second, instructors need to demonstrate to their learners how class tasks can be carried out. Learners would not be able to undertake the tasks until the structure of lesson plans and other relevant requirements are shown to them. Third, instructors should regularly evaluate their learners' performance because evaluation is a crucial part of the learning process. And lastly, instructors should talk less—an autonomous classroom is one that allows learners to have more time for discussion among themselves.

In our training project, we have adopted a few steps proposed by Nunan (2003) to ensure that learners would be independent in regulating the learning process. Specifically, all the steps above were applied except for Steps 3, 8, and 9. Step 3, which encourages learners to use English outside the classroom, is not the aim of our training project. Steps 8 and 9, which encourage learners to become instructors and researchers, are apparently fruitful to preparing learners to become truly autonomous. However, as Nunan (2003) proposed, these steps are part of "the educational process" (p. 195), and we are afraid that within the limited time that we had, we wouldn't be able to implement these two final steps.

3. Pedagogical Context

One of the authors taught an English grammar course during the second semester of 2018 at Suan Sunandha Rajabhat University, Bangkok, Thailand. Towards the end of the course, a group of learners complained

about a lack of opportunity to practice English pronunciation in class, since there were only a few listening-speaking classes and no pronunciation-focused class. Impressed by their motivation to improve their English pronunciation skills, the instructor discussed with them the possibility to teach them basic knowledge of phonetics in conjunction with the use of Praat outside the regular class.

Towards the end of the semester, we delineated the plan for an extra-training period and proposed it to the whole class. Learners were informed that this project would be entirely voluntary; it was essentially a project for those who really wanted to develop their pronunciation skills. We made it clear to learners that there would be no grade given, and no commitment to the training session was required.

3.1 Learners

Six learners volunteered to participate. The small number of participants was not beyond our expectations; it reminded us of Dam's (2008, p. 14) remark, that "the biggest hurdle when developing learning autonomy is to make the learners willing to take over the responsibility for doing so". In this project, it was the willingness—the voluntary commitment to themselves—that we emphasized from the outset. These six learners were full of enthusiasm to work hard to achieve their pronunciation goals, and we believe that this is a compelling attribute for autonomous learners.

Among the six learners, there were four females and two males. They were all 18-year-old second year English majors. We refer to them henceforth as S1–S6. (S stands for Speaker).

3.2 Contents

There were three sets of information provided to the learners by the instructor: the basic knowledge of phonetics, the operation of Praat, and the selection of voice models.

First, the instructor narrowed the scope of phonetics to stress and intonation because these were the aspects of sounds that were accessible in the most straightforward way through the use of Praat. Second, the instructor explained to her learners how to use the Praat program, starting from how to download the program to their computer, then how to upload

their own voice and transfer the voice models from other sources, and finally to how the lines and waveforms on the screen could be interpreted. In terms of selecting the voice model for imitation, the instructor provided information about the goals of English pronunciation practice that have been debated in the literature.

For decades, English has been predominantly spoken by non-native speakers (Jenkins, 2000), posing a new challenge to the methods and goals of English teaching and learning as a means of communication. The goal of pronunciation practice has been shifted from sounding "native-like" to being intelligible. With this goal of intelligibility in mind, the learners were encouraged to expose themselves to a wide variety of English accents available on the internet. They had the autonomy to select speech samples of their own choice as their target model. The term "model" in this article follows one of two definitions taken from Brown (1991, p. 39), which state that a model is "the accent presented for imitation". The selected sound materials were copied for private use and transferred to Praat for imitation practice.

3.3 Period of Training

The training project was divided into two periods. First was a week of workshops, followed by a 10-week period of self-training. Altogether, our learners spent approximately three months self-practicing English pronunciation.

3.4 Venue

The workshop took place at the university's classroom. The instructor met with learners on the workshop week. During the 10-week training right after, learners practiced by themselves at home.

3.5 Evaluation Tools

In an autonomous classroom, the instructor's constant evaluation and the learner's self-evaluation are crucial steps in the learning process (Dam 2008). In this project, we asked learners to record their tasks and progress in a journal so that they could reflect on their learning process.

A questionnaire was administered to the learners in order to examine their level of satisfaction towards the training. Here are the details of each tool:

3.5.1 Self-Reflection Journal

The instructor asked the learners to write a daily journal entry in a notebook provided to them. They were asked to write (a) length of practice, (b) activities, (c) self-reflection, and (d) plan for the next day.

3.5.2 The Instructor's Observation Record

The instructor took notes of their progress each week. Learners could contact her over the phone or in a LINE (freeware communication app) group chat. Through her notebook, the instructor recorded the questions and concerns that learners raised.

3.5.3 Questionnaire

A post-training questionnaire was given to learners at the end of the training to investigate learners' satisfaction towards the training as well as the use of Praat.

4. Pedagogical Flow: Learner-Instructor-Software

In this section, we describe how the instructor and her learners interacted during the workshop and the training.

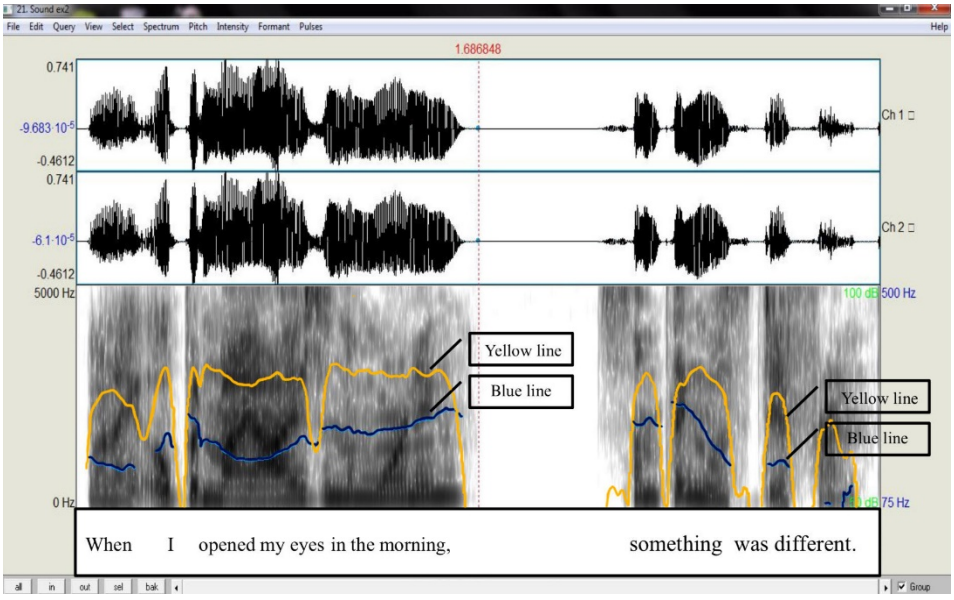
4.1 Workshop Week

Day 1. The instructor and the learners discussed their goal(s) for this training project. The goals involved the selection of voice models and what aspect of suprasegmentals they wanted to focus on. Despite the goals of intelligibility that the instructor clearly explained to them, they nonetheless targeted their pronunciation towards the native or near-native level, followed by always choosing voice models produced by native English speakers. After discussing the goals of training, the instructor explained about pitch, stress, and intonation. She then introduced the Praat program to the learners.

In using Praat, the learners needed to install two additional software programs: Format Factory and GoldWave. Praat supports WAV, MP3, and many other file formats.[1] In order to download audio files from other sources into Praat, file types other than the ones indicated in the website must be converted to WAV or MP3 by a converter. Format Factory is a freeload converter, while GoldWave is a recommended sound-editing software and can be easily used to cut and paste the selected utterances. The instructor then taught the learners how to interpret the waveforms on the screen. Intonation was represented by a blue line whereas stress was indicated by a yellow line. Learners could practice stress and intonation at the word level as well as the sentence level. Figure 1 shows what is displayed when an utterance appears on the screen.

Figure 1

Sample of the Waveforms, Pitch Movement, and Loudness on the Praat Screen Produced by S1



Day 2 and 3. The learners practiced operating the Praat program on their own at home. The number of hours spent practicing were up to them.

Day 4. The instructor arranged a two-hour meeting with them to discuss any technical problems they had.

4.2 Ten-Week Training

The following week was the beginning of the self-training period. Learners were encouraged to find at least 20 minutes per day, 5 days a week, to use the Praat program at their residence. First, they could choose whatever voices they preferred as the target models. They also had to choose some sentences for practice. Then, they would upload their chosen word/phrase/sentence segments to Praat.

Within the Praat interface, there were lines which they needed to pay attention to: yellow and/or blue lines, depending on the type of sound features they were examining. After practicing reading aloud, they would record the same word/phrase/sentence in the program. Then, they would look at the waveforms of their utterances and compare them with the same segments from the voice models. Again, the blue and yellow lines would indicate the acoustic results of their utterances. They would print out the screenshots of the voice model and their own utterances, and look for similarities and differences in terms of stress and intonation. Whenever they wanted to assess how close their utterances were to the target model, they would re-record their speech, use the yellow and blue line functions, and print out for comparison once again. Learners met up with the instructor every two weeks to submit their journal and to discuss any problems/questions.

Evidence from their journals, as well as the conversations between the instructor and the learners, showed that some of them almost gave up due to the difficulties of operating Praat while trying to understand the phonetic concepts of stress, pitch, and intonation. The main difficulties came from too much time being taken up when converting the sound files from the original streaming source to WAV. Although Praat is able to read many types of files, including MP3, WAV is the default sound file format which, from our experience, gives the best quality to analyze speech sounds. Learners were therefore encouraged to convert other sound file formats into WAV or MP3 before they uploaded them into Praat.

Learners engaged with Praat for several hours per day during the first week as they came to grips with reading and analyzing their sound files. This week was critical as all of the learners struggled through a process of trial and error, as recorded in their journals.

From the second week onwards, however, the learners gradually gave more positive feedback, as seen in their journals. In particular, more than half of them said that they would like to keep self-practicing English pronunciation after the training. We found that the task might be tedious to do every day; they preferred to practice 3–4 days a week. They also preferred to select voice models on their own, indicating that they would be independent and responsible for self-training in the future, and that learner autonomy could have been fostered. Below are the learners' reflection notes collected from their journals.

4.3 Self-Reflection Journal

On average, learners practiced 3–4 days per week, for approximately 25 minutes per day. The voice models that they selected to imitate were from two main sources—one was from YouTube. Many e-books are available on YouTube and they provide a wide range of accents to explore, although learners chose to practice from the ones read by either British or American English speakers. The stories they chose included *Winnie the Pooh*, *Charlotte's Web*, *Twilight*, and *All the Light we Cannot See*. The other source of voice models came from the Bangkok Post (an online English-language newspaper).

During the daily practice, learners usually picked one long sentence, or 2–3 short sentences to work with. They looked at the waveforms and graphic lines of sentences uttered by the selected voice model, identified the stressed positions and the intonation patterns, drew the lines, marked the stressed words on a separate piece of paper, and imitated the sentences. When they felt that they had gained a certain degree of fluency, they recorded their voice, compared their stress and intonation patterns with that of the voice model, and printed out the results to keep a record of their progress. One copy of the printout was also submitted to the instructor.

Having read their journals, we began to understand their obstacles and frustrations towards the training project. Some information reported in the journals were beyond the researchers' control. Some were non-linguistic factors affecting their motivation. We read learners' journals inductively in order to identify and organize patterns of ideas: i.e., themes, which are shown below:

Frustration is Defeated by High Aspirations. The first week was the toughest for our learners as reflected in their LINE messages and journals with comments such as: "I cannot feel any improvement." (S1, journal, 13/09/18); "I feel so frustrated I'm thinking about quitting." (S3, journal, 13/09/18); "Giving up being gay is much easier than using Praat" (S4, LINE message, 24/10/18).

The learners' frustrations mainly appeared to stem from complications in copying the selected sound files and uploading them in Praat. However, despite their frustration, their motivation remained high, which was probably why no one withdrew from the training, even if this contradicted what they wrote in their journals. Yet different learners had different sources of motivation. For example, S1 wrote that she was a big fan of a Korean singer. She wrote: "His English pronunciation was excellent, and he inspired her to keep practicing." (S1, journal, 06/11/18)

The Crucial Role of the Instructor. Although the journal was meant to be for self-reporting, the learners were well aware that it was not entirely for private use, and that eventually the instructor would ask for their permission to read it. As a result, it seems that the writers were sometimes conveying messages directly to the instructor. For example, in her journal, S1 states: "I kept my eyes down on the reading list the instructor had given me. After the word 'down', the blue line remains stable without movement. So, I'm not sure if I should read with the monotone pitch. I will ask Ajarn the next time we meet" (19/09/18). Likewise, in a journal entry by S4 we see explicit reference to her instructor: "a notification of a virus popped up on my computer, so I scanned the virus, and boom! All my files are gone. That's right, Ajarn. I feel so bad" (15/11/18).

In a way, writing for an Ajarn (referring to "instructor/teacher" in Thai) is a beneficial tactic, as they knew that they would receive feedback and guidance directly from their instructor. We believe that one of the reasons why they didn't give up is because they knew that they would be receiving full moral and technical support from the instructor.

Non-linguistic Obstacles that Impeded the Practice. Throughout the study, the learners often wrote of unexpected obstacles in their journals that hindered their routine practices. These included the sound of rain, no Wi-Fi connection, too much homework to do, and other hurdles unrelated to the use of the program itself. These obstacles were beyond our control and had a detrimental effect on learners' motivation and enthusiasm to practice. Fortunately, such hindrances were defeated by the learners' intense devotion. Their perseverance proved that their motivation remained high.

5. Discussion

5.1 The Instructor's Observation

At the beginning of the project, the instructor discussed the goals for practicing pronunciation with the learners. She asked them how much improvement they expected to make from participating in the project. All of them hoped that their pronunciation would be as close to native or near-native level as possible, although they were aware that the intelligibility principle was more realistic than the concept of reaching near-native level pronunciation.

Their preferred voice models were native-speakers of English, especially American or British. Their preference for the native-voice models was in line with Jindapitak and Teo (2013), who questioned the preference of English varieties among Thai learners. The authors used a questionnaire to ask 52 college learners about the English variety that they preferred to learn. The result showed that the majority preferred native-speaker varieties, although other World Englishes were also acceptable.

During the workshop week and the first two weeks of training, the instructor played a key role in guiding them through the technical difficulties. In the second week, the learners still needed help with the problem of pitch enhancement. The instructor reminded them that this project was on a voluntary basis, and so there was no need to put pressure upon themselves. If they felt that practicing 5 days per week was too much of a burden, they could reduce it to 3 days per week.

Apart from the technical problems, the instructor noticed that some voice models were too difficult. In that case they were advised to

change to easier ones. Towards the final week, the instructor saw them adapt through their daily routines of practice. They gained more confidence in the use of Praat. All of them now reported that they had no problems with recording from or using Praat. They also gained self-control of monitoring their own progress.

5.2 Post-Training Questionnaire

We conducted a questionnaire in week 8 in order to evaluate the learners' degree of satisfaction. There were 10 questions written in Thai and posted in a Google Form. Seven questions used 5-point scales ranging from 1 (least/worst) to 5 (most/best). The other 3 were open-ended. In Question #1, we aimed to find out the learners' perspective on if they thought they had gained any benefits from the training. Questions #2 and #3 asked their opinions about a suitable length of time for the training. Question #4 concerned the instructor's performance. Question #5 was to find out if they were happy with selecting the voice model themselves rather than following the instructor's directions. We raised this question because some linguists argue that the concept of autonomy is not appropriate for Asian pedagogical contexts (e.g., Sakai et al., 2010). Question #6 surveyed the type of sounds that were their main concern. Questions #7–#10 asked for their suggestions for future training. The results are shown in Table 1.

Table 1

Results of the Post-Training Questionnaire

Questions	Number of learners	5-point scales
1. This training project is helpful to improve your English pronunciation. (1 = not at all, 5 = very helpful)	4 (66.7%) 2 (33.3%)	4 (quite useful) 3 (average)
2. How many days per week do you feel that you should practice? (1) Everyday, (2) 3–4 days/week and (3) 1–2 days/week.	6 (100%)	2 (3-4 days/week)

Questions	Number of learners	5-point scales
3. How suitable is the 10-week duration of the pronunciation training with Praat? 1 = the least suitable, 5 = the most suitable	4 (66.7%) 2 (33.3%)	5 (most suitable) 4 (suitable)
4. The instructor explained how to use Praat clearly. 1 = disagree, 5 absolutely agree	4 (66.7%) 1 (16.7%) 1 (16.7%)	5 (absolutely agree) 4 (quite agree) 3 (average)
5. Preference to choose the voice models by yourself Yes/no	6 (100%)	Yes
6. The phonetic features you would like to have a special training practice. (You can choose more than one items). Consonants, vowels, stress, pitch, intonation	1 (16.7%) 2 (33%) 6 (100%)	vowels stress intonation
7. When the training project is over, do you plan to practice pronunciation by yourself, even though you don't have to write a journal or do the recording task? Yes/no	4 (66.7%) 2 (33.3%)	Yes No

According to the ratings from the questionnaire, learners felt that this project was helpful. They preferred to practice 3–4 days a week, and a ten-week training period was considered a suitable time range to practice. Four learners agreed that the instructor explained how to use the program clearly, and all of them wanted to choose the target voice models by themselves. Intonation was the most preferable focus of practice. Lastly, 4 out of 6 learners said that they wanted to continue practicing reading aloud with Praat after the training.

Questions 8 and 9 asked about the strengths and weaknesses of using Praat, which will be discussed in the last section. The feedback from learners is given below:

Table 2

Feedback on Strengths and Weaknesses from Learners

Strengths	Weaknesses
1. The blue and yellow lines (indicating the pitch movement and stress) are quite straightforward to understand. 2. The pitch movement, rising and falling, is easy to understand and practice. 3. It is easy to find where the difference in stress, pitch, and intonation occurred. 4. Learners can practice more on the specific words. 5. The program allows WAV and MP3 for the voice input, so it is quite convenient to use any speech sources.	1. The screen is not wide enough to be able to see the waveform of a long sentence. 2. The software does not adjust the relative pitch range automatically; many times, the lines did not appear on the screen display. 3. The software is not user-friendly for non-linguists.

The last question asked if learners had any advice/suggestions to increase proficiency in English pronunciation. Learners said that they would like to work with a software program that is easier to operate, yet allows speech input from other sources like Praat. They wish to see software that has good recording quality and a clear screen display.

At this point we would like to sum up our discussion by answering three questions using the learner's journals, our observation notes, and the questionnaire results.

5.3 What Are the Learners' Responses to this Training Project?

Feedback from the post-training questionnaire indicates that the learners' desire for self-practice remains strong despite the first week spent struggling to operate the Praat program. We believe that they were able to complete the 10-weeks of training sessions despite all the difficulties thanks to the collaboration between learners and the instructor. Their determination to improve their pronunciation skills throughout the training bears some evidence that the project was fairly useful. We were delighted that they were positive with the project, as Dam (2008, p. 25) pointed out, an autonomous classroom should give "scope for interested/happy/engaged/satisfied learners". And as Boersma and Heuven (2001, p. 345) admonished not to "try this [=Praat] at home", nevertheless, we have to admit the reality that the Praat program was too complicated for self-training—learners would not be able to operate the

program unless they receive close assistance from an instructor. Setter and Jenkins (2005) similarly disapproved of Praat, positing that "computer readouts of formant plots require a sophisticated level of understanding which may be lacking in many instructors and learners, or take too much classroom time to develop" (Setter & Jenkins, 2005, p. 10)

A question arises. Given that Praat is not user-friendly, one may ask why many previous studies give it tremendous support. We believe that the positive reports in previous studies using Praat in the classroom were caused by the researcher's simple recording of the voice model (usually the instructors' own voices) through the microphone connected directly to the program. By using the direct recording function, there is no need to convert the voice file from other sources into WAV or MP3. Users can enjoy practicing English from internet sources at the expense of the time taken to convert the sound files to the types compatible with Praat. According to the last question we asked in the questionnaire, we speculate that not all our learners would use Praat for self-practice at home in the future, but all of them remained positive towards self-regulation and determination to develop their pronunciation skills.

5.4 What Are the Strengths and Weaknesses of Using Praat?

Strengths. The highlight of Praat is that it is a freeware program, which can be downloaded instantly. Users have freedom in selecting authentic voice models, unlike most commercial programs which are designed to only equip users with built-in speech files. Furthermore, Praat shows clear graphic movement; the lines are quite straightforward and easy to understand. The pitch movement, rising and falling, is easy to interpret and practice accordingly. Moreover, it is easy to find within the screen display where the difference in stress, pitch, and intonation are shown, thus learners can repeatedly practice isolated words.

Weaknesses. Most of the problems are technical. First, learners found it cumbersome to copy the voice models from one source and paste them to the Praat program. It took a great deal of time to cut and paste their own voice to make a comparison with the waveforms of the target model. Second, the screen is not wide enough to be able to see the waveform of a long sentence. Third, the software does not adjust the

relative pitch range automatically; many times, the lines did not appear on the screen display. As mentioned earlier, Praat accepts many types of files, but WAV and MP3 give the clearest picture. If users want to analyze voice models extracted from various sources whose file formats are not included in the program, they must find ways to convert the sound files into WAV or MP3 before being able to analyze the speech.

5.5 What Are the Roles of the Instructor in Promoting Learner Autonomy through the Use of Praat?

We found that in promoting learner autonomy, the instructor plays a crucial role in the learner's achievement level. Essentially, the instructors need to guide learners to project their pronunciation goals based on the principles of intelligibility as opposed to "nativeness". The voice models to be selected by learners do not have to be from varieties of English within the inner circles (i.e., British, American, or Australian). In this regard, we agree with Sewell (2016, p. 94) who posited that "in adapting pedagogy to global English, the focus could perhaps shift to goal, rather than the model". Instructors also need to explain the linguistic aspects of pronunciation skills. If possible, learners should be taught the basic principles of phonetics and phonology, as it is quite useless to look at the display screens shown in Praat unless learners know how to interpret them. The instructor must train learners to use Praat and give them feedback regularly to keep them motivated.

5.6 Suggestions for English Instructors

We learned from this training project that in order to be able to promote the use of Praat for self-practice outside the classroom, complications concerning the usage of the computer tools should be reduced to a minimum, and that the learners should not use the complicated procedure of copying and pasting voice files. One way to reduce such difficulties and save time and energy is to let the program store and read the sound files without converting them to WAV. However, while sound files other than WAV can be read, the graphic displays may not be as clear. All in all, we realized that not every learner will benefit from using Praat. Whether they benefit or not depends on their own accountability and on how much they can maintain motivation and

endurance in the self-training. That is why we did not force the whole class to participate in this training; only those who are willing to broaden their learning experience would have the potential to benefit from such a program.

6. Conclusion

Praat can serve as a useful tool to aid self-guided learner practice outside of the classroom for learners of all levels because they can choose authentic voice models available on the internet instead of being assigned voice models by instructors. One caveat is that there is no one-size-fits-all design for the application of Praat; its use depends on an individual's aims. The instructor's role is to foster learner autonomy, although the results depend on the learner's effort as well as the kind of goals they set for themselves. We would like to encourage English instructors and practitioners to collaborate with phoneticians to introduce Praat to learners, so that learners can analyze their stress and intonation in comparison with voice models and self-monitor their progress.

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Endnote

[1] See for further information: https://www.fon.hum.uva.nl/praat/manual/Sound_files_3__Files_that_Praat_can_read.html?fbclid=IwAR1LF9ym1u_FHl-_DKplRwjHeqFzcS35juyp-5l2qJlf2IpCrP6c01xjTO0

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