Research on the Function of Visual Phonetic Software Praat in Vocational English Phonetics Teaching

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Abstract—Phonetics teaching is the most difficult part of English majors in higher vocational colleges. Many students are affected by their mother tongue pronunciation habits and the lack of systematic voice training at the middle school stage, resulting in weak phonetic foundations. There are problems such as inability to correctly distinguish between long and short vowels, voiced consonants, emphasized and light pronunciation, and intonation. To this end, the introduction of the visual speech software Praat, using its visual and intuitive image characteristics can assist teachers in class, help students find the pronunciation errors in time and correct them in time. Based on this, this article will combine the status quo of English phonetics teaching in higher vocational colleges and analyze the role of Praat phonetics learning software in phonetics teaching and its specific application implementation.

1. INTRODUCTION
Phonetics, like grammar and vocabulary, are the three most important aspects in linguistics. The learning of vocabulary and grammar can be mastered through regular teaching and repeated memory. However, the teaching of phonetics focuses more on the actual pronunciation of the students, and it has a great relationship with the pronunciation habits of the students in their native language. The traditional voice teaching method is very abstract, and it is difficult for students to grasp and understand it only by text description. As an important material carrier in foreign language learning, speech also plays a role in information transmission and emotional expression. If the pronunciation of speech is wrong, it may be misunderstood and cause communication troubles. At the same time, correct pronunciation has also become one of the criteria for judging whether English is fluent and proficient. As the most intuitive expression in speech, we must pronounce accurately to improve our overall English level and to lay a good foundation for future foreign language communication and work. At this stage, English phonetics is also a professional course that English majors must study. The biggest problem in phonetics teaching is that many students have very weak phonetic foundation. This is mainly related to the fact that they only focus on theoretical study and problem-solving while neglecting the study of the phonetic system in the middle school stage, as well as their own native language and dialect habits. Restricted by the teaching concept and method level, the pronunciation teaching of many higher vocational colleges still has the problem of repeated practice and mechanical imitation. There are also problems of inconsistent and unscientific performance evaluation standards when testing learning results. However, it is difficult to find every student's pronunciation errors in time only with the supervision and evaluation of the teacher alone. The students themselves are not clearly aware of their pronunciation errors, and over time they will develop the habit of pronunciation errors and cannot be corrected.
With the development of teaching technology and computer technology, various teaching aids and methods have also been applied to English teaching. The use of visual media technology by voice teachers can not only reduce the pressure on teachers, but also understand the pronunciation of students more clearly. In addition, this also allows students to discover and correct incorrect pronunciation in time through independent learning and detection. Among many speech pronunciation analysis software, Praat is a professional visual speech analysis software. The software has the advantages of friendly operation interface, free download to the computer, small space occupation, timely software update, and high degree of visualization. The application of this software in English phonetics teaching in higher vocational colleges has played a very strong value in phonetics teaching, autonomous phonetic learning, and error correction. It is also a very popular voice learning software for students and teachers.

2. THE STATUS QUO AND PROBLEMS OF VOCATIONAL ENGLISH PHONETICS TEACHING
First of all, students in higher vocational schools are generally weak in English, especially in oral English and English pronunciation teaching. Many students did not receive systematic language learning in middle school, and they did not pay enough attention to pronunciation. This leads to the confusion of the students' pronunciation and intonation, which brings great difficulties to the English phonetics teaching in higher vocational colleges. In the case of students' weak voice foundation, teachers can hardly stimulate their interest in voice students. If teachers still use traditional phonetic teaching methods, adopt a single teaching method, and pay attention to theoretical teaching rather than system practice, students will become bored with phonetic learning. In addition, teachers do not have an objective evaluation standard for students' speech learning. This makes it impossible for students to correctly see their progress and areas for improvement.

3. OVERVIEW OF VISUAL SPEECH SOFTWARE PRAAT
Praat is a visual voice teaching software developed by the Dutch. It is a cross-platform professional software with multi-functional linguistics. The software can recognize, label and analyze speech signals. It can display different language maps as required after the audio is obtained, and obtain data such as pitch, duration, formant frequency, etc. through calculation, which has the characteristics of objective and intuitive. It has a great effect on voice-assisted teaching, voice autonomous learning and voice error correction [1]. The software can be downloaded and used for free, the operation is more convenient, and the graphic information feedback is clear. Colleges and universities can apply it in the English pronunciation teaching of higher vocational colleges, so that it is convenient for teachers and students to operate. Students can use the software to learn independently, discover their pronunciation problems and correct them in time. Teachers can also clearly understand the students' voice mastery based on the analysis results of the software and make objective evaluations. In this way, students' problems can be found in time and targeted help can be provided.

4. THE FUNCTION OF VISUAL SPEECH SOFTWARE PRAAT IN ENGLISH SPEECH TEACHING IN HIGHER VOCATIONAL COLLEGES
First of all, pronunciation is an important basic element in English learning. The proficiency and accuracy of pronunciation is directly related to the quality of students' English language learning. If students in higher vocational colleges want to effectively improve their English level, they must first solve the problem of weak voice foundation. Teachers in higher vocational colleges should scientifically design voice teaching courses based on the characteristics of school students, supplemented by Praat voice learning software, and adopt diversified teaching methods. In this way, teachers can use the software's visual and intuitive features and various teaching activities to stimulate students' interest in voice learning. Secondly, considering that English learning is very complex and abstract, teachers using traditional teaching methods cannot eliminate the phenomenon of describing English language, let alone check out each student’s errors in the pronunciation of a certain word one by one. The practical difficulties of these phonetic teaching make it very difficult to comprehensively improve students' English phonetics. After using Praat learning software, it can be used as a visual
voice-assisted learning tool to visualize abstract English voice segments in the form of spectrograms. This not only enables students to intuitively discover their own pronunciation errors, but also avoids the teacher’s inability to clearly describe voice segments. It also enables students to correct incorrect pronunciation in time, thereby improving the level of English phonetics learning. In addition, in view of the traditional English phonetics teaching, in order for students to read each word correctly, the teacher needs to emphasize and tell the students which syllable the stress of the word should fall on and which syllable needs to be read better than others. The syllables are longer and heavier. However, students will find that they cannot master these skills well in actual practice, and even forget which syllable is the stressed syllable after a period of time. This is because these concepts are relatively abstract, and because they are restricted by their previous pronunciation habits, they cannot master the real pronunciation skills correctly. After using Praat software, the intuitiveness of the software allows students to clearly understand the correct pronunciation of each syllable. For example, taking the word university as an example, it can be found from the spectrogram that the correct pronunciation should be to place the accent on the middle syllable, so the spectrogram also shows a shape of high middle and low sides on both sides. If the pronunciation is wrong, it will show a low middle and high sides. From the comparison of the following two pictures, students can quickly understand the mistakes in their pronunciation of this word, and they can correct them in time after being aware of the deviation. As long as the students compare the standard and wrong pronunciation spectrograms, they can correct their biased speech to achieve the most ideal state [2].
use of visualization software Praat software to assist voice teaching can enable students to more clearly find their own voice problems and correct them in time. The visual speech software transforms students' pronunciation into intuitive graphics and presents them to students, and compares them with standard spectrograms. Students can find errors in intonation, accent, long and short vowels, voiced consonants, and correct them through repeated training and corrections. From the perspective of acoustic characteristics, pitch, intensity, length, and sound quality are attributes that every word has. Therefore, students start from these four voice elements when analyzing language features, and the voice software also recognizes and distinguishes from this element of sound. In the existing English phonetic textbook China, the description of the acoustic characteristics of English words is described by abstract text, which is difficult for students to understand. Then, teachers use Praat software to make a spectrogram, which can turn abstract text into concrete and vivid graphics. From these spectrograms, we can clearly observe the fundamental frequency, duration, pitch, tone intensity, and formants of a certain sound. As a result, the following paragraphs will use Praat voice software to analyze the common mistakes of vocational college students in voice learning from the perspectives of long and short vowels, voiced consonants, light sounds, and intonation in English phonetics teaching.

5.1. Research Preparation
Before taking classes with the visual speech software Praat, the teacher must first install the software on the teacher's computer and carefully check whether the software can run normally. Afterwards, teachers need to select voice text materials from the voice textbooks used by the students of the school, and input the standard English pronunciation text into the software. To test the effectiveness of the software, teachers can first select a few students who have typical errors in their pronunciation, input their biased speech, and compare and analyze them with standard speech. When recording audio, select the address in a quiet and noise-free place, and ensure the quality of the recording equipment. After recording these corpus, teachers can analyze the problems of students' pronunciation and pronunciation through software analysis.

5.2. Error Analysis of Long and Short Vowels
As one of the acoustic characteristics of the formant, the formant direction and values of a vowel can be clearly displayed on the spectrogram. Take the words leave and live as examples. The letter ea in leave is a long vowel, and the i in live is a short vowel. However, limited by the pronunciation habits of the native language, some students cannot distinguish between long and short vowels correctly, and many students do not distinguish the difference in pronunciation of long and short vowels. Using voice software to display the pronunciation error spectrogram and standard pronunciation spectrogram, students will find that there are four lines on the pronunciation map whether it is wrong or accurate. These four lines represent the acoustic characteristic of the formant of the vowel pronunciation. However, the ea in leave is a long vowel, so the formant appearing on the spectrum has a gentle direction. If the direction of the formant peaks appearing on the spectrum is relatively steep, it means that the long vowels are pronounced as short vowels. Using Praat voice software to practice repeatedly, students' pronunciation problems on long and short vowels can be well improved. Students can consciously distinguish between long and short vowels and correct their incorrect pronunciation in time.

5.3. Analysis of Consonant Voiceless and Voiced Errors
In the pronunciation of English consonants, the main problem is the addition of vowel phonemes after the sounds ending in consonant phonemes or in the consonant clusters, making voiced sounds become unvoiced. As one of the important acoustic characteristics, the unvoiced and voiced consonants may cause misunderstandings if students cannot distinguish and pronounce them correctly. However, most students in China are influenced by dialects, and often use unaspirated initials to replace voiced consonants in English, and the pronunciation of words with voiced consonants will cause pronunciation errors. Take the book as an example. The first and last morphemes are voiced English consonants, and
the correct graphics on the spectrogram should have dark and dense sound areas. When voiced sounds are pronounced, there are long straight bars. If this feature does not appear, it means that the voiced sounds of the word have been pronounced as unvoiced [3].

5.4. Stress Bias Analysis
Chinese circumflex and confound emotions can be distinguished by listening to the four tones, but the English language relies on stress to express emotions. The important acoustic characteristics of stress are pitch, length and intensity. Take the word record as an example. When it is used as a verb, the stress comes after it, and when it is used as a noun, the stress comes first. If it is the first syllable to be accented, its basic frequency is higher than when the syllable is weakly read, and the duration is longer and the tone is stronger. The role of accents in English and tones in Chinese is similar. They are also used to express a certain kind of emotion. If they are mispronounced, they will naturally cause certain misunderstandings and affect communication. In addition, the acoustic feature of tone intensity can be intuitively seen from the spectrogram of the distribution of English word stress using Praat speech software. Through research and analysis, it is found that many students are accustomed to putting all the stress on the back syllable rather than on the first syllable. In order to enable students to intuitively discover their own problems in accentuation, take the word “operate” as an example, enter the student’s incorrect pronunciation into the software and compare it with the correct pronunciation. The correct pronunciation of the word should be to place the stress on the first syllable. However, comparing the correct spectrogram and the false spectrogram, it is found that there are two curves with different directions in the two pictures. This curve is the pitch line that distinguishes the accented sounds from the lighter sounds, and the correct direction should show a downward trend. However, the error spectrum is an upward direction. The highest peak of the word pitch is no longer on the first syllable but at a later position. From this, it can be judged that the student's pronunciation is wrong.

5.5. Intonation Error Analysis
Intonation is different from intonation. Intonation is the height of the voice, and intonation is a kind of accent when speaking, and it should have a change of ups and downs. Although the intonation of Chinese and English has the characteristics of rising and falling, there are certain differences between the two. For example, in declarative sentences, the adjustment style of Chinese is a downward trend of intonation, but when English declarative sentences are read aloud, they are not all in a downward tone. For example, in a declarative sentence, some nouns are listed, so except for the last noun, all nouns should use the rising tone. So the correct spectrogram should be able to see that only the last part is showing a downward trend, while the other parts are rising. But the wrong spectrogram is a graph showing a downward trend completely [4].

6. Problems that Need to be Paid Attention to in the Application of Visual Speech Software Praat in English Speech Teaching in Higher Vocational Colleges
Although Praat voice visualization software has great advantages in assisting English voice teaching by using its intuitive and visual characteristics, there are also many problems in actual operation. First of all, although the software is simple to operate and has intuitive graphics, for some students in higher vocational colleges, the interface of the software, especially the images displayed, are still too professional and not interesting. Students need to spend a lot of time to figure out the knowledge of acoustics and phonetics, otherwise they cannot really understand the meaning of each part of the spectrogram. If they don’t have phonetics expertise, they will not be able to distinguish or understand professional terms such as pitch, pitch and formant. Secondly, the software has higher requirements for sound recording. If the quality of the recorded audio is not good, there are noises or other problems, the software may not be able to accurately identify the audio file, and may even cause inaccurate detection and mislead students. In addition, the use of the software puts forward higher requirements for teachers' speech ability. When students lack professional knowledge in acoustics and phonetics, teachers must help students understand the meaning of these maps. Therefore, teachers themselves must be proficient
in the software in advance. In the meantime, the software also puts forward high requirements for teachers' professional quality. Teachers must be proficient in phonetics expertise to be able to combine phonetic knowledge with practical operations. Teachers can improve the efficiency of the software by carefully designing courses and combining diverse and interesting teaching methods. This will also help increase students' interest. Before students use it, teachers should follow the principle of starting from the shallower to the deeper, teaching students to understand the differences and associations between phonemes, words, phrases, sentences, etc., and perform the phonetic training of words first. Then, the phonetic training of phrases and sentences is performed, and the training of the segments is performed first, and then the intonation and voice training are performed. Although there are still certain difficulties in popularizing voice learning software, the continuous improvement and optimization of voice software, and the combination with the market voice self-learning APP, and the combination of information technology and media interaction technology are convenient for students and teachers to operate. The small program based on Praat voice learning software can be directly operated on the mobile phone, which is more convenient and efficient to use [5].

7. CONCLUSION
In summary, the voice visualization software Praat is a practical and easy-to-use voice analysis software. The software is widely used in English phonetics teaching in higher vocational schools. Teachers can understand the students' errors in the pronunciation of words in time through the analysis of voice results, and help them correct them in time. Meanwhile, teachers also adjusted their teaching strategies, optimized the design of the classroom, combined with diversified teaching methods, and gave students more opportunities to practice practical operations to improve teaching efficiency and teaching quality. Students can use the software to study independently. Through the intuitive and vivid spectrogram, it can help them understand their own errors in pronunciation. Furthermore, Praat software can use standard spectrogram as the target to correct in time. Students can visualize the language by observing the acoustic features of English vowels, consonants, continuous reading, accentuation, etc., so that they can better master pronunciation skills and make targeted improvements. This will also help improve their English pronunciation and overall English learning quality.

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