An Analysis of Phonological Software and Its Application in an EFL Context.

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Pronunciation Power 1

Product Information

Product Type:

English pronunciation course for EFL/ESL learners

Publisher:

English Computerized Learning, Inc

Website URL:

http://www.englishlearning.com

Language:

English

Language Level:

Beginner through to Intermediate

Activities:

Listen, repeat, record and compare phonemes, words and sentences. Various listening exercises and games.

Media Format:

CD-ROM, Pronunciation Power 1 (Beginner to Intermediate), Pronunciation Power 2 (Intermediate to Advanced)

Computer Platform:

Windows 95, 98, 2000, or NT4 (or Macintosh System 7.5.3 or later)

Hardware Requirements:

800x600 resolution at 16-bit (thousands) of colours; 4x CD-ROM drive or faster; High quality microphone; Speakers; 5MB available disk space

Price:

Individual copy (includes 8 in 1 English dictionary), US $144.95

General Description

Content

Pronunciation Power 1 (PP1) is a unique interactive course designed for language learners to improve their English pronunciation and listening skills. The software aims to establish good pronunciation habits and to assist second language learners to recognize and correct their own oral productions. The program is presented in English, however there are translations of the instructions available in 12 languages. Some of these include Spanish, Korean, German, French, Japanese and Portuguese. The program is designed for use with language learners from the beginner to the intermediate level. For more advanced students the next level of software can be utilized. The software can be used in addition to language instruction in the classroom or as a means of independent study outside the confines of a structured classroom and teacher/student interaction. The pronunciation exercises and related activities and games are easy to operate, suggesting that the program would be suitable to include with any introductory course in English communication. The program is composed of four main modules with each module containing manageable segments that will not overwhelm the learner. The modules are labelled as: Lessons, Exercises, Dictionary and Games.

Operation

The program is operated by students and is not accessible by the classroom teacher. Figures 1, 2 and 3 show screen displays in two of the modules mentioned in the following section.

There are 10 buttons, which are clearly visible and provide basic operations within the program. Knowledge of all buttons is not required to operate the program from the first module, allowing students to become familiar with the operation of each button gradually. In the first module there are two Arrow buttons, which are distinguished by size. The smaller of the two can be used to go forward and back, up

and down within that particular section of the program. The larger arrow is used to listen to sound recordings and view a video display. There is also a Recording button, which can be used to make recordings by the user after listening to a sound sample and a Square button, to discontinue recording. In the next module a Headphone button is used to listen to sound recordings of words and sentences before making a recording. In the final module there are two additional buttons, one labelled as New and the other Start. These buttons are used to initiate and change various games. Throughout the entire program three other buttons are always visible at the base of the screen, these include a Print button, Help button and an Exit button.

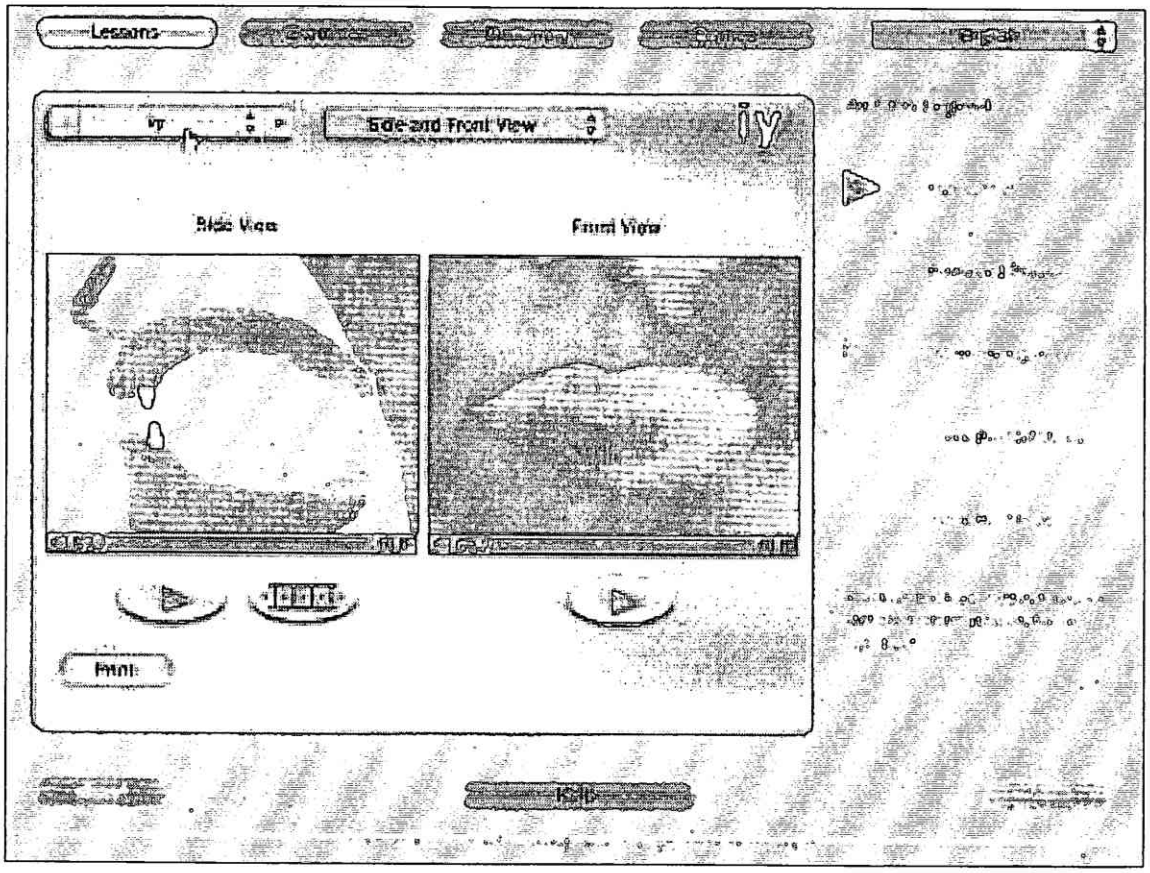

Figure 1- First Display in Lessons Module

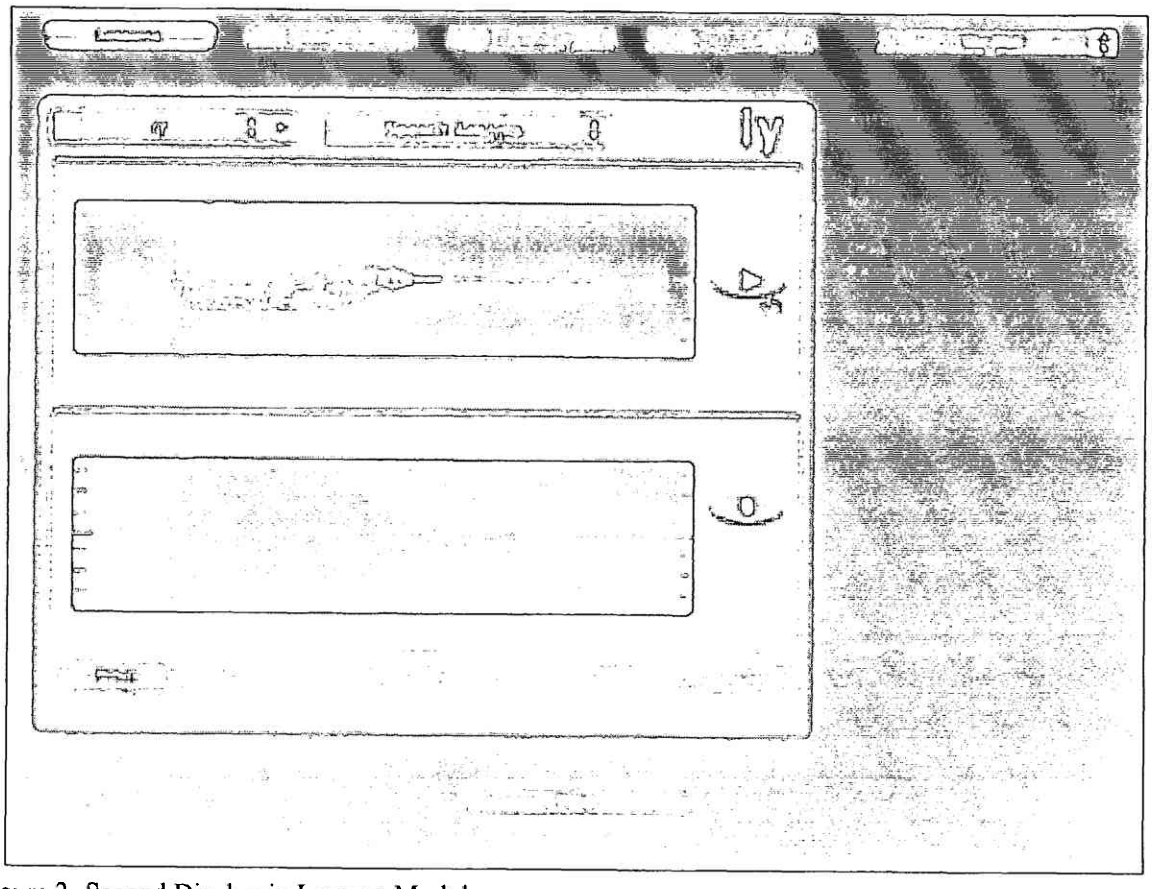

Figure 2- Second Display in Lessons Module

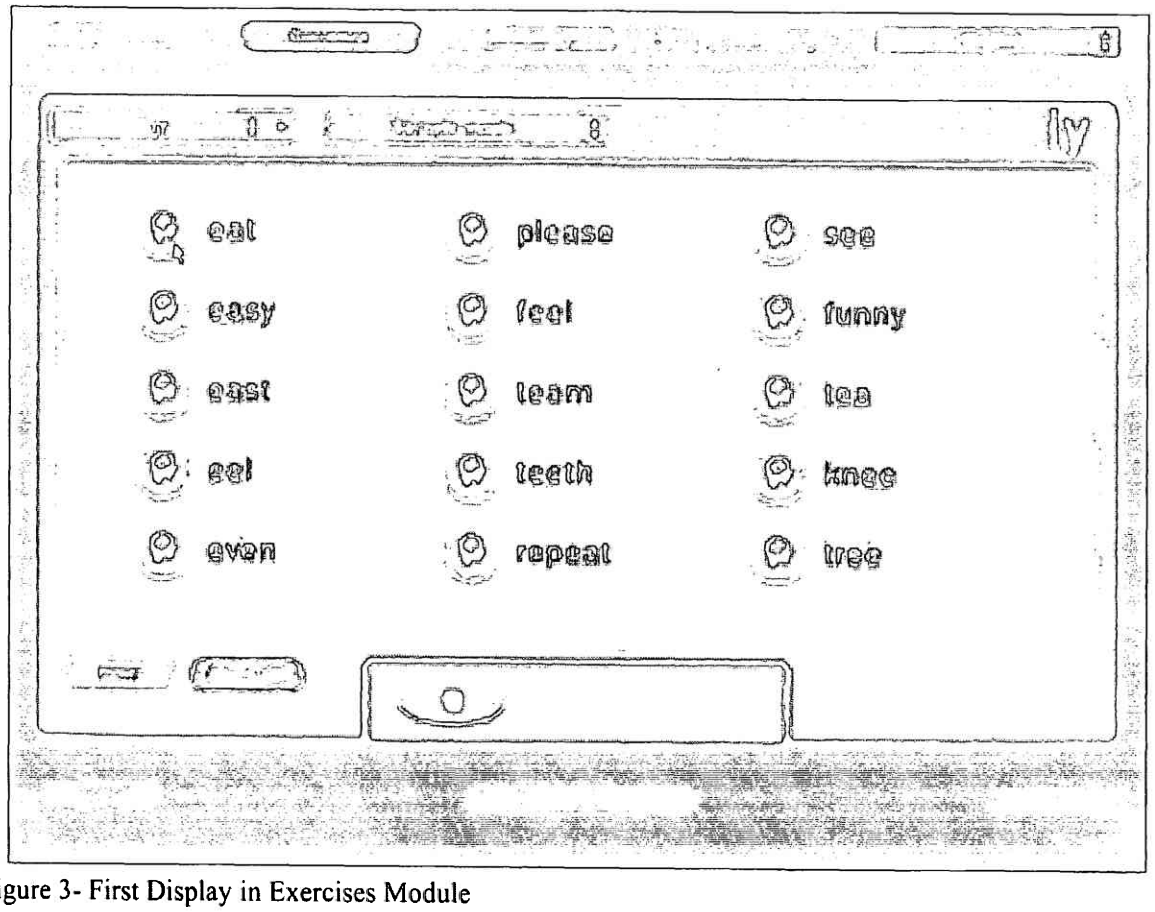

Figure 3- First Display in Exercises Module

Evaluation

Technological Features

PP1 was tested by the reviewer using Mac OS 9 running on an iMac with 128 MB RAM. Installation of the program was straightforward and took very little time. For computers, that do not contain Quick Time, it is first necessary to install this software. This is a simple procedure as the software is part of the CD-ROM. Once this has been installed it is only a matter of double clicking on the program itself. Once installed, the program ran smoothly with no stalls or crashes to the system.

The screen design is simple and navigation through the program is relatively easy. After entering the program it is clear that the first requirement is the selection of the language in which any instructions and additional information will be displayed. Although, the instruction itself is in English, the languages are represented in their corresponding written format, making it easy for those language learners who cannot read the Roman alphabet to make the appropriate choice.

Having selected a language it is then possible to read the instructions for the program by clicking on the Instruction button located at the bottom of the screen. These instructions appear in the order in which new material is encountered when working through the program in a systematic fashion.

The Help Bar at the bottom of the screen is a useful tool as it allows the user to place the cursor over a button or functional area for which they are not familiar. The particular instructions for that part of the program are then displayed at the base of the bar. These instructions also appear in the language selected by the student. It is possible to change languages at any stage in the program by simply selecting from the Language Menu, which is always displayed in the top right-hand corner. Once students become familiar with the functioning of the program they may wish to view instructions in the target language.

The program follows a logical sequence with visual and auditory instructions for the production of sounds in English. Each sound is accompanied by a visual illustration of real-time articulatory movement (see Figure 1). A side view and a front view for each sound are available. The side view is an animated drawing containing the complete articulatory mechanics such as the location of airflow and placement of the tongue and lips. The front view is a video of a real person, displaying jaw, lip and tongue protrusion. A useful Air Flow Legend is included on the right-hand side of the screen when working in the sound section of the program. When listening to a particular sound one of the five symbols is displayed in the side view

diagram to indicate how the sound is articulated.

The buttons used to initiate parts of the program and to transfer to different sections of the program are relatively easy to understand. It is not necessary to memorize a large number of key functions. Most of the symbols are symbols with which the learners will probably already be familiar. Navigation through the program, could however be improved. In the bottom left-hand corner of the screen there is an extended arrow, which can be used to take the user back to the main screen. As the majority of websites and software programs make use of the terminology 'Home' or 'Main Menu', it would be more appropriate to use a button labelled as such, as most programs which use arrows usually indicate a return to the previous page. In addition to this the Record button which is displayed as a grey coloured button would be more suitable in red, being the colour used on most electronic equipment with a recording function.

One other associated problem is that when using the Help Bar to access additional information about the screen the extended arrow may be used to return to the previous display. However, if this is clicked for a second time the program will return to the main menu. This may initially confuse students working with the software.

The voice examples provided in the program are clear and easy to understand. In the first screen within Lessons, both a male and a female voice sample are provided. However, following this in the Speech Analysis section and the subsequent Exercises, Dictionary and Games only a male speech sample is given. In future development of the software it would be more appropriate to provide learners with a male/female speech choice.

Procedure

Once students have selected the language in which they wish to view instructions they have the option of choosing from a number of different activities displayed in the menu bar at the top of the screen.

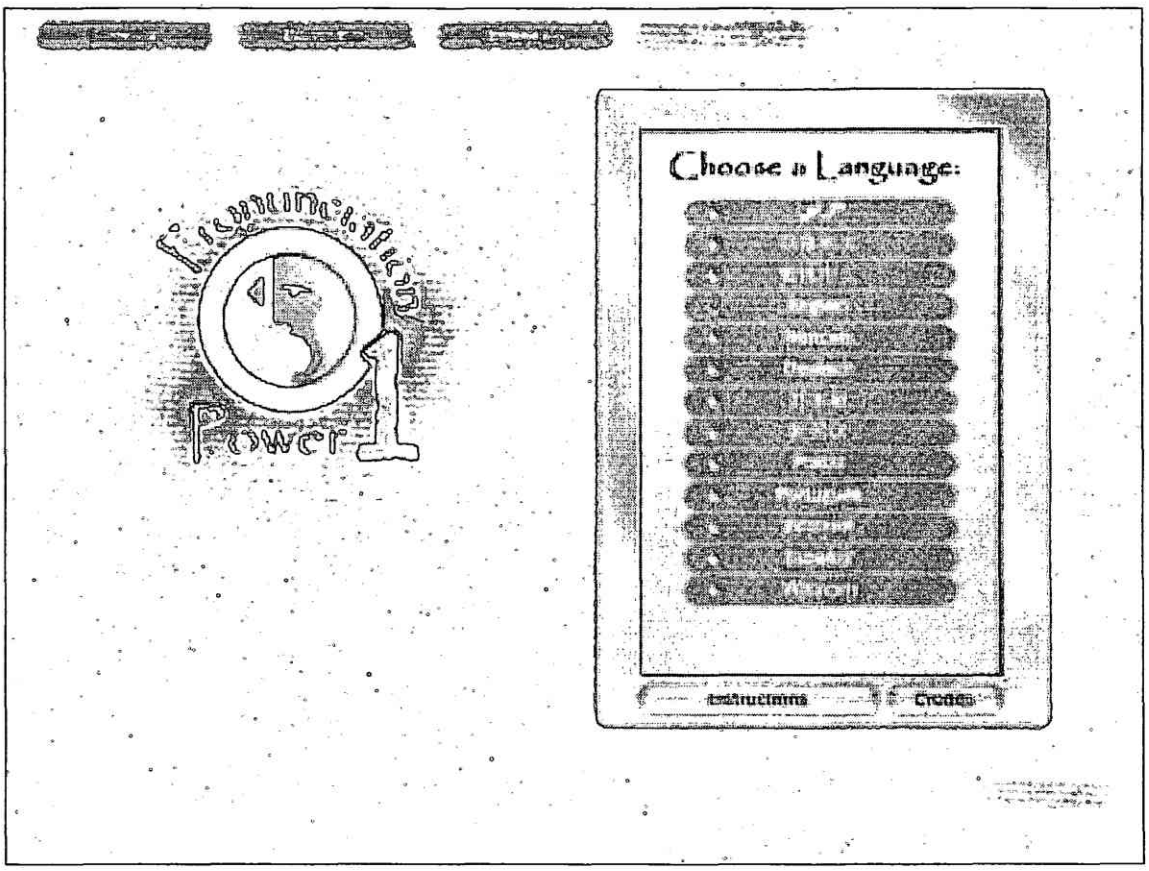

Figure 4- Main Menu/ Language Selection

There are four main modules in the program that are arranged structurally, guiding the learner from the most basic to the more complex of phonological language skill development. Students are first exposed to listening to sounds in isolation and reproducing these, to later forming the same sounds in longer segments of continuous speech in the target language. According to much of the literature and research which has been conducted in the area of phonological development, the approach utilized is justified and the sequencing of the exercises appropriate (Carruthers, 1987; Chastain, 1971; Finocchiaro, 1989; Morley, 1991).

PP1 focuses on four areas of study. They include:

1. Lessons- divided into two sections. The first provides a visual and auditory explanation of the production of sounds in the English language. The second examines the area of speech analysis, making use of waveforms to provide the learner with visual feedback when producing utterances in the L2.

2. Exercises- a variety of exercises, which focus on comparative words, listening discrimination,

stress, timing, articulation, intonation and pitch and rhythm.

3. Dictionary- students may search for words according to a theme or grammatical function such as noun or verb, or words beginning with a particular alphabet letter. Where appropriate a graphic for the selected word is displayed and a sample sentence given. Students may also access the sound function of the program to listen to the pronunciation of the selected word.

4. Games- a variety of interesting games, which provide the learner with additional opportunity for listening and speech production practice.

Before utilizing the program in the classroom it would be necessary to give students a certain amount of instruction with regards to the information contained in the Air Flow Legend in the Lessons module. If the material is used with beginners many of them will be unfamiliar with the importance of tongue placement and movement of the mouth when making utterances, as this is something which takes place automatically when acquiring one's first language. For beginners learning a L2 this concept needs to be addressed prior to program use. Although the program contains a reasonable amount of instructions, most of these are related to the operation of the program rather than the instructional aims of each particular section of the software, especially the first Lesson and subsequent Speech Analysis section.

The first module contains 52 sounds from the English language, which are represented as phonetic symbols. For beginning language learners these symbols may present a problem. It would therefore be advisable to work through small sections of the sounds presented, allowing students to become familiar with not only the sounds but also the symbols, which represent them.

Throughout the program learners generally engage in a variety of visual, aural and oral exercises.

1. Learning activities generally take the form of practice exercises, making it important for the teacher to provide the formal instruction necessary for the learner to utilize the software to its full potential. In the first Lesson section and within the Instructions area (page 3 of 10) there is a small amount of information with regard to the function of the major articulators in the vocal tract, as these are displayed as symbols in the Side View of the sound video (see Figure 1). This information may overwhelm students encountering language learning for the first time unless they receive prior instruction. Once familiar with the articulatory movement of the vocal tract learners may work unassisted.

2. Learners listen to sounds in the target language divided into vowels, consonants and cluster sounds. Whilst listening to the sound they are able to view a cross-section of the oral cavity, displaying positioning of the tongue and movement of the mouth. In addition to this they can listen to the same sound with a front view of a real person's lip position and tongue movement (see Figure 1). Language learners begin to associate phonetic symbols with sound and discriminate between the pronunciations of sounds.

3. Learners view a graphic representation of a sound utterance produced as a waveform (see Figure 2). The user then records the same sound production for comparison against the native speaker's sample. The learner is provided with an opportunity to make unlimited recordings that can be evaluated against the instructor's sound and waveform. Learner utterances may also be recorded on disk for evaluation at a later stage during language development. This is an important feature of PP1 as learners have access to a valuable learning tool by which they can visualise the sounds they produce and compare them with the native speaker's example. Learners also have an opportunity to listen to instant feedback of their own speech production and compare this with the instructor's voice sample. Although this is not a new concept, it does not require the use of a tape recorder. Students can record and listen to their voice whilst viewing the screen display. This is the main advantage of CALL over other media used for learning, as there is an opportunity for learners to interact and receive instant feedback from the software. This feature alone justifies the outlay when compared with alternative, cheaper audio and videotapes used in the teaching of phonology.

4. In follow-up exercises learners are able to hear sample words and sentences of the phoneme they have practiced (see Figure 3). Once again an opportunity is provided to make a recording that can then be compared with the native speaker's example. Comparative word examples allow learners to listen to and practice words that are contrastive minimal pairs, helping them to distinguish the different sound between two words. Within the exercise it is possible to access the Dictionary module to view the particular word highlighted and how it can be used in a sentence. If a verb is selected it is displayed in its various grammatical forms. Sound may also be accessed in this section of the program. Additional exercises include Sample Words in which the selected phoneme appears at the beginning, middle and end of a word. S.T.A.I.R exercises provide the learner with an opportunity to listen to and practice features of speech such as stress, timing, articulation, intonation-pitch and rhythm. This is made possible by the use of a number of symbols such as large and small dots, which are used to indicate the S.T.A.I.R features in sentences. Learners may also

listen to the sound recording that accompanies each example. Listening Discrimination exercises provide the student with a list of pair words in which the learner must distinguish if the phoneme is the same or different. Discrimination sentences are also provided.

There are some problems in this section of the program with regard to the lack of feedback provided to the learner. Many of the exercises only indicate whether the answer selected by the learner is correct or not. There is no informative feedback given to assist the student with phonological development.

5. Interactive games are mainly concentrated in the last module of the program and are divided into two categories, listening games and recording games. There are four games in total. In the listening section learners can test their listening skills by matching the word utterance with the appropriate picture. A clock is also provided enabling learners to try and improve their timing of word recognition and selection (see Figure 5). Another game requires learners to listen to words and then select the appropriate phonetic sound contained within the word. As the correct squares are selected they disappear to reveal a picture underneath (see Figure 6).

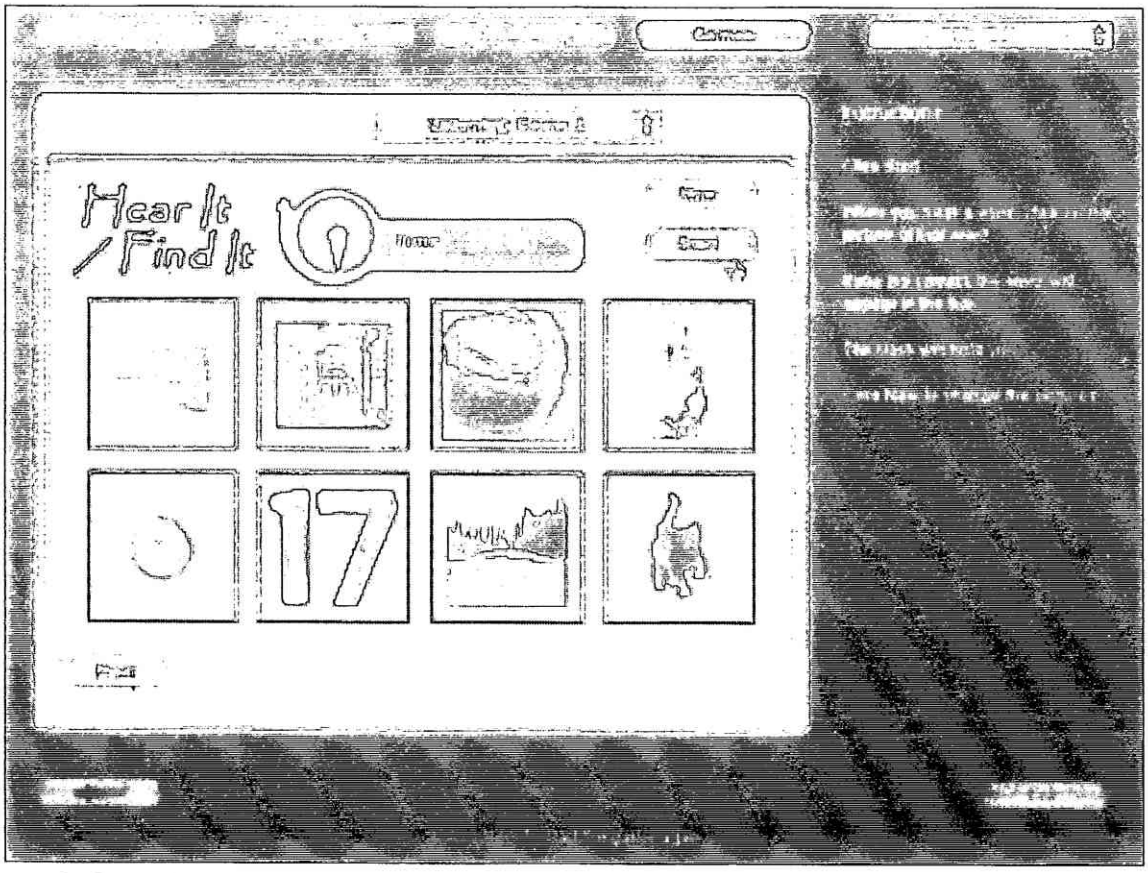

Figure 5- Games/ Listening

In the recording section of the module learners are provided with a series of graphics based around a particular topic or theme. For example, animals, colours, numbers and clothes. Some of the letters of each word are provided to assist with the correct response. The learner then records the word and at the conclusion of the game the native speaker's voice can be compared with the learner's vocalizations.

In the final game the language learner is provided with a series of pictures for which they must provide a verbal response by naming the object. When the ten objects have been identified, clicking on each graphic will produce the instructor's verbalization of the object and the word recorded by the learner.

In each of the games it is possible for learners to get extra practice by selecting the New button, which will produce another set of examples.

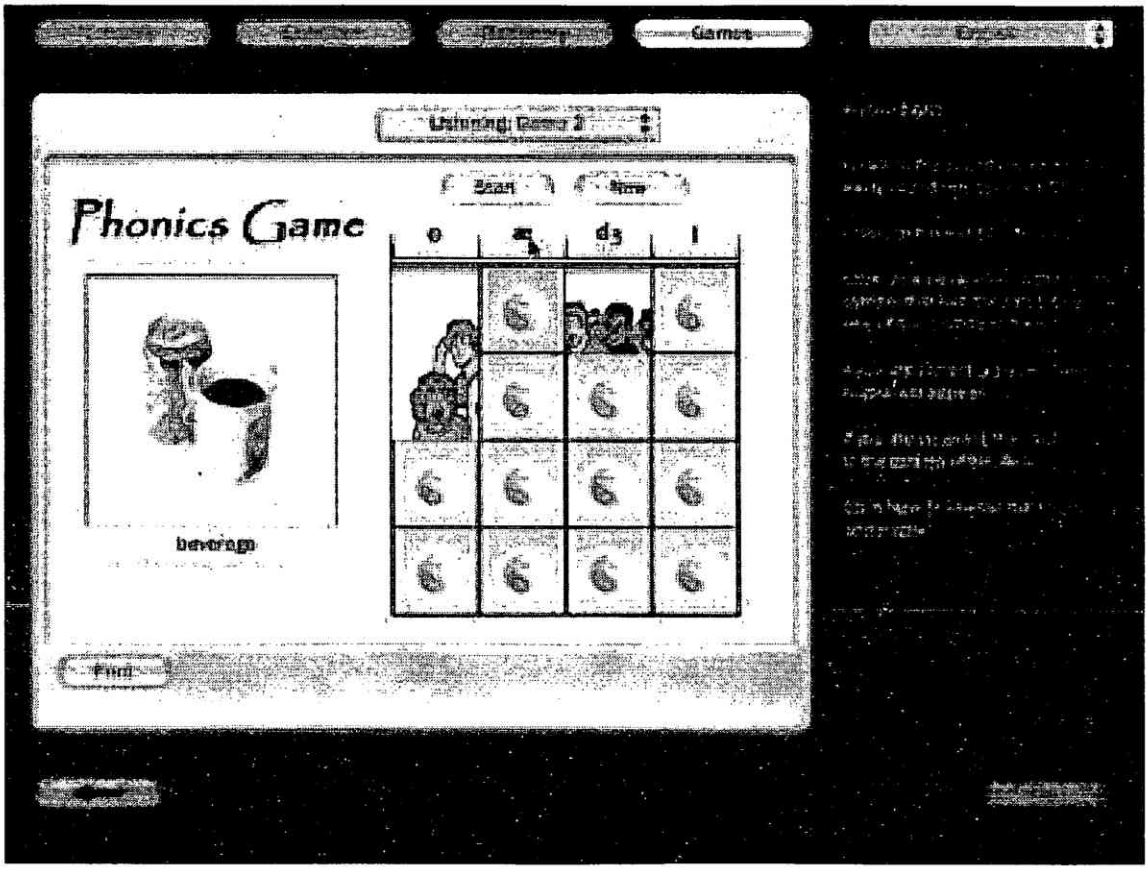

Figure 6- Games/Matching Phonetic Sounds

There are some weaknesses in the final module of the program with students only being required to provide single word answers rather than longer segments of speech practiced in the Exercises module. Some of the graphics could also be improved, as it is difficult to determine the response required for some

pictures. Verbal responses by the native speaker are only provided in American English leading to the inappropriate labelling of some objects, in instances where a learner uses British English as the preferred English. It would be advisable to provide examples of both American and British English where differences occur with vocabulary.

The music included in the Games module and played at the conclusion of Listening Game 1 and 2 should be omitted and replaced with a simple *Well done! or Congratulations!* as it becomes quite frustrating to repeatedly listen to the same melody.

Theoretical Approach

The theoretical principles underlying PP1 are traditional and commonly shared by many educators working in the area of second language phonology acquisition. The program is primarily based on the audiolingual method of instruction. This instructional procedure involves the process of listening and the subsequent repetition or imitation of information, in the case of PP1, sound components of the English language. Listening and repeating are key components in the development of L2 pronunciation and are skills frequently practised in the EFL/ESL classroom. (Carruthers, 1987; Morley, 1991).

After extensive use of the software it appears to be based on the following theoretical principles:

1. The assumption is made that accurate listening and correct or more appropriately native-like pronunciation are prerequisites for the development of effective listening comprehension and speaking proficiency. In order to develop such listening skills students must first be able to distinguish all sounds in the L2 and discriminate between them and their L1 (Chastain, 1971).

2. There is the supposition that unless language learners are frequently involved in oral communication settings in a natural environment, they will require additional assistance to develop proficiency in listening and speaking in the L2. Part of this development lies in the acquisition of effective pronunciation skills.

3. The hypothesis is made that the structured presentation of the phonetic system of the target language will help to create an awareness of the sound system, something that listening tapes used in the classroom settings may fail to do. By providing students with a resource for unlimited phonological practice in the L2, the program attempts to make learners more perceptive in their

listening and more accurate with their pronunciation of phonemes, words and sentences.

It should be noted that developing an awareness of the phonological structure of the target language will not, in itself improve the speech of the language learner. Once learners become aware of problems which exist in their L2 speech they can begin to try and make changes to the utterances they produce. This is a slow process and one that requires constant effort and repeated practice on the part of the learner. Students in the initial stages of L2 development also require the assistance of a teacher, as many may be unaware of the errors they produce.

4. By examining the structural format of PP1 it is clear that the development of phonetic accuracy in isolation is insufficient in the development of L2 acquisition. Students must apply this knowledge to exercises contained in the program that require the further verbalization of words and sentences. PP1 focuses on listening and the imitation of sounds produced by a native speaker. While this particular approach may appear old-fashioned, the most successful way to learn correct L2 pronunciation is by imitation (Carruthers, 1987). This application of software would be ideal for use as one component of a comprehensive language course, focusing on the development of the four macro-skills. The sound system is an integral part of language, and the study of pronunciation something which cannot be avoided in the methodology of an EFL/ESL program.

Methodology

PP1 provides learners with a limited amount of instruction focusing mainly on an interactive approach or methodology to the acquisition of second language phonology. Students are provided with a visual and oral presentation of sound utterances in the target language, which can be played and replayed at any stage throughout most of the program. An analysis of each sound is given with a cross-sectional animated drawing and the use of symbols to demonstrate how the sound is produced. Students can then take this information to try a variety of exercises and games, which reinforce the work covered in the first module of the program.

Although use of the program can be guided by the classroom teacher in the initial stages, once students are familiar with the main features of each module they may be free to move throughout the program. Where learners feel the need to review sound utterances or listen to recordings previously made they have access to such facilities. By providing students with some control over their learning they may determine for themselves where they need to spend extra time. This is something in a large class that the teacher is often

unable to do. Students have an opportunity to actively participate in phonological language development through repeated listening and vocalization of sound utterances provided in the program. This may help to further motivate students to improve in other areas of L2 acquisition.

PP1 aims to further assist learners in the area of self-analysis by providing students with immediate visual feedback through the use of waveforms, based on student's speech production. Learners are presented with a visual representation of utterances that can be compared against the visual representation of a native-speaker's speech. Importance is also given to the development of aural skills as this is seen as a prerequisite for self-diagnosis of production errors, in an attempt to develop phonological accuracy.

By the use of a visual display students are able to learn how to produce the appropriate sound by associating the display with the actual feeling of making the sound. For many students the learning step of being able to see a visual display of sound production assists them to reach the final stages of acquisition much faster. The visual display provides students with an objective measure whereby they can focus attention on the exact features of the sound, which need to be altered. Although it may be difficult for students to recognize sound differences in the initial stages of language acquisition, they can feel and see the difference on the computer screen.

As with some other phonetic software programs, students are not required to master the IPA (International Phonetic Alphabet), however it is a useful tool in the recognition and development of the sound system of a L2. Although the program does not place any particular emphasis on the IPA symbols, students could be encouraged to pay attention to these whilst working through each module. Carruthers (1987) suggests that while some may see the study of phonetic script as an unnecessary burden for students it may actually aid them in the effective development of L2 speech production. It is a consistent and reliable means of identifying sounds in the target language. It can also be utilized by teachers to provide both a visual and aural example of an utterance. In addition to this, students can become more independent, consulting their dictionary to determine the correct pronunciation of a word. Whilst the aim of the software is not to intimidate learners by working systematically through the 52 sounds contained in the program, in small sections students could be encouraged to learn the symbolic representations. In order to assist students to acquire such knowledge a section on the matching of phonetic symbols and sounds could be included in the Games module.

As many phonetic symbols are actually similar to the alphabetic letter they represent, students could become familiar with the system within a relatively short period of time. As there is not a great deal of

emphasis placed on this particular aspect of phonology in the present software, one of the games contained in the Games module of the program may be quite difficult for students to complete successfully.

Linguistic Evaluation

With regards to the voices selected for use in PP1, both the male and female examples are clear and easy to understand. However, one obvious shortcoming is the lack of female examples in exercises and activities throughout the program. Apart from the first screen in the Lessons module where students may listen to and view a video clip of a woman's lip movement, no other female voice is used in the program. Once learners proceed to the Speech Analysis section and subsequent modules of the program only a male speech example is provided. The program should provide learners with the option of listening to either a male or female speaker.

It would also be appropriate at this time to discuss the use of North American English, which is the variety of speech that has been used with PP1. Although the software comments on the fact that each person's voice is different and unique, it would perhaps be useful to point out to students using the program that the CD-ROM provides an example of only one pronunciation of English and that there are many other world Englishes, each with their own unique phonology. Although the list is almost exhaustive the reviewer would ideally like to see alterations made to the program to include examples of other forms of English pronunciation, allowing students to at least be able to hear variations that occur in the pronunciation of phonemes and words.

Program Implementation

Although the program is ideally suited for use in a self-study situation, it could also be used in a computer laboratory or a classroom setting. In a language laboratory the program could be networked or alternately operated on individual workstations. It could be used as a resource to supplement communicative classroom activities in which students practice using the L2 in the classroom. Often during such activities little time is allotted to the phonological features of the L2, as the main objective is to encourage students to exchange information. In a class containing a large number of students the teacher is also unable to assess the phonological skills of all the members. By providing students with access to such a program more time could be devoted to other aspects of language development in the classroom.

With beginning students the program could be utilized in a classroom setting with all the students working

at the same pace directed by the teacher. In this way the instructor could direct the student's attention to particular features of each module, for example, the importance of the phonetic symbols in understanding particular sounds produced and the symbols used to illustrate the articulatory mechanics of sound production. Once students have developed some degree of confidence they may be encouraged to use the program as a means of improving their pronunciation in the L2. This may take place outside of structured classroom hours, enabling students to direct their own course of study. For learners who feel uncomfortable about making utterances in the L2, PP1 can provide an ideal environment in which to develop language proficiency.

Students' Level of Competency

Although PP1 provides clear, precise presentations of the production of sounds in the English language, there is little introductory explanation with regards to the way in which the actual sounds are produced. The systematic progression from the study of the phonetics of the language to the application of such information in various exercises and games is of benefit to the language learner studying English for the first time. However, if implemented by the absolute beginner working in isolation, without teacher assistance, it may prove too challenging a program in the initial stages of language study. Although the program provides instructions written in a number of different languages, the majority of these are just that, instructions. Actual language instruction in the area of articulatory movement and the interpretation of speech waveforms is limited, leading one to believe the program would be better suited to the learner who has already completed some preliminary second language study. For students working at the elementary level a certain amount of input from the teacher would be advisable to ensure students gained the maximum benefit from the use of the software. This could include the study of English phonemes in small sections and then the preliminary exercises and games contained in the modules that follow. As the software provides no measurement of assessment in identifying problem areas of pronunciation it would be advisable for the teacher to target the specific phonemes individual learners should work on. If left to study alone the student may fail to detect pronunciation errors that need additional practice. Those students who have completed prior study of the phonetic structure of the English language could use the program to eliminate non-native features of speech and improve their listening ability.

Summary

PP1 is easy to use and can be mastered by students within a relatively short period of time. Extended use of the program will increase student's auditory and articulatory skills in the L2, providing learners with a solid

base from which to further develop language proficiency. The program can be used as a resource both within the confines of the classroom and as a means of allowing motivated students or otherwise, access to develop and improve pronunciation skills in the target language. It provides students with an opportunity to repeatedly listen to and practice sounds, where they would ordinarily have to approach the classroom teacher. Learners are presented with real-time visual feedback of the utterances they produce, which can then be compared with that of a native speaker's sound production. This assists students to detect errors in their own speech and make the appropriate corrections based upon the visual feedback they receive. Without the use of such a program this would not be possible.

PP1 provides students with an alternative means of developing phonological proficiency, a move away from the continuous instruction of the classroom. It is the means by which students can become familiar with the sounds of the L2 and at the same time attempt to imitate them. It is through such repeated practice that students will develop the native-like proficiency that many of them hope to achieve.

Overall Evaluation

1- Very Unsatisfactory

2- Unsatisfactory

3- Undecided

4- Satisfactory

5- Very Satisfactory

Implementation Possibilities - 5

Pedagogical Features - 4

Linguistic Evaluation - 3

Ease of Use - 5

PP1 User Trial

This study aims to investigate the utilization of pronunciation software (Pronunciation Power 1) by Japanese senior high school students engaged in the study of English. Observation focuses on the level of interaction, which takes place between the language learner and the CALL software and the value of such software in an EFL course.

Methodology

The subjects of the study were students enrolled in a senior girls private high school in central Japan. The study, involved students from a third year senior high school English class classified as intermediate level English ability. The students had been studying English for a period of 10 hours each week and were highly motivated to learn the language. The only prerequisite for the selection of the students was that they be able to attend a one-week CALL class in the afternoons, after school. Five students who could meet the requirement volunteered and created the trial group. This small number also enabled the observer to closely monitor the subject's utilization of the modules in the pronunciation program.

Data was collected through observation and subsequent student questionnaires asking the subjects to rate the software according to a number of set criteria. The students were given the questionnaire in both English and Japanese to ensure full understanding of the questions being asked and the collection of accurate information. The questionnaire consisted of 20 items with all questions requiring a response on a five point rating scale. The subjects were asked to rate each statement with one of the following responses:

1- Strongly Disagree
2- Disagree
3- Undecided
4- Agree
5- Strongly Agree

The subjects who participated in the study were informed that they would be observed to examine the way in which they interacted with the pronunciation software. They were also told that they would not be observed to assess their level of pronunciation. This would have made the students nervous and restricted them in their use of the program. One of the aims of the study was to see how students used the computer software in a teacher unassisted environment.

The study involved a one-week trial, with each session consisting of 40 minutes. This period of time was allotted in an attempt to simulate the time a student would possibly work in a self-study situation following a language class either in the school computer laboratory or at home. A 40-minute time period also allowed the students approximately 10 minutes working time with each module in the program.

Prior to commencement of the first session students were given some preliminary instruction with regards

to the operation of the program, specific features of PP1, the use of the International Phonetic Alphabet, the articulatory movement of the mouth and associated terminology and the Speech Analysis component of the program.

Findings

In the students first encounter with PP1 they were observed to be quite impressed with the first screen in the Lessons module because they could both listen to and view the articulatory movement of the mouth in the video. However, upon moving to the next Speech Analysis section they appeared hesitant to make the first vocalisation. After several minutes they began to relax and enjoy experimenting with the sound feature and waveform display in the module. The students were quite concerned about obtaining the same waveform as the native speaker's example and spent a considerable amount of time in that section of the program. Only when reminded that they should practice all components of the program within the 40-minute session did they move on to the next module. Whilst working in the waveform display, two of the students were observed to return to the first screen to review the movement of the mouth and tongue. The students were very satisfied when they began to obtain waveforms with similar dimensions to the instructor's speech.

By the time the students had entered the Exercise section of the program they were continually listening to and repeating utterances produced by the native speaker. Once again some students went back to the Speech Analysis section to practice the correct pronunciation.

In comparison to the Lessons and Exercises section of the program the students spent a relatively short period of time in the Dictionary module. However, while working in that section they were found to practice the sample verb forms and sentences provided.

In the final Games module some students were initially confused about what they were required to do. All students enjoyed working against the clock to improve their recognition time of words in the Hear it/ Find it listening game. However, some displayed their annoyance with the music played at the conclusion of each game. One student also commented on the choice of some vocabulary in the Games section. Examples of this included the word *hog* rather than *pig*, also the word *ape* in preference to *monkey*.

In subsequent lessons the students were observed to begin working with the program much faster. They did not suffer the initial embarrassment they experienced in the first class. It was also interesting to see that

during the week three of the students brought mirrors to the class in order to monitor their own mouth movement and compare this with the video in the Lessons module. It should be noted that the observer did not initiate this exercise. At the conclusion of the first session the subjects talked amongst themselves, with one student suggesting a mirror would be useful for monitoring mouth movement.

On the second day the students were reminded to spend approximately 10 minutes using each section of the program. However, on Day 3 and 4 the students were given no reminders as to how long they should work on each module. The following tables provide a summary of the time individual students allotted for each module in the program over a 40-minute time span.

DAY 3	**Lessons**	**Exercises**	**Dictionary**	**Games**
Student A	0:00	0:18	0:28	0:32-back to Exercises
Student B	0:00-stayed in Lessons			
Student C	0:00	0:10	0:21	0:25-back to Exercises
Student D	0:00	0:15-stayed in Exercises		
Student E	0:00	0:25-stayed in Exercises		

DAY 4	**Lessons**	**Exercises**	**Dictionary**	**Games**
Student A	0:00	0:10	0:20	0:33
Student B	0:00	0:33-back to Lessons		
Student C	0:00	0:15	0:25	0:34
Student D	0:00	0:19	0:24	0:35-back to Exercises
Student E	0:00	0:26-back to Lessons		

* - back to (indicates the student returned to a previous section after a period of time)

During the week all students appeared very diligent in their use of the software with constant reference being made to screen one in the Lessons module before moving on to practice the next sound. The subjects were continually observed repeating sounds in the Lessons module and making verbalisations throughout all modules in the program. It was also noted that some students spent a considerable amount of time in the Lessons section and in particular the Speech Analysis area as this was the first opportunity the subjects had had in using visual feedback to assess their pronunciation skills.

At the conclusion of the trial period the subjects were asked to respond to a questionnaire (see Appendix). This was done during the final class with all students taking approximately one hour to work through the program and answer the 30 questions contained in the questionnaire. The students were given no time restriction for completing the questionnaire and were encouraged to work at their leisure.

The three statements that scored the highest were Question 12, 28 and 29. Question 12 was regarding the use of comparative word examples to assist with hearing the difference between words, while Question 28 asked students if they would like to use the software on a regular basis. Question 29 asked students if they thought their pronunciation would improve with the use of the software. In all three questions four of the five students gave a rating of 5, with the remaining student giving a rating of 4.

The two statements that scored the lowest were Question 17 and 18. Both of these questions concerned the Dictionary module, with the students rating general use of the dictionary and looking up words with the dictionary component of the software poorly. All five students gave this a rating of 1 or 2.

In their overall rating of the software four of the students selected *Very Good* and one student, *Good*.

Discussion

The use of PP1 in a large class may create some problems when students attempt to record their own utterances to compare with the native speaker's sound production. In the trial situation it was possible to separate the subjects in order to ensure that the built-in microphone did not pick up surrounding noise. This was done by leaving two computers vacant between each student. However, with a large class using a computer laboratory this may not be possible. In the facilities used for the trial, the workstations were situated close to each other. There were 40 computer terminals and with the majority of classes containing 40-42 students it would not be possible to leave every second terminal vacant in an attempt to cut down on surrounding noise. This may result in learners having difficulty with the waveform section of the Speech Analysis part of the program. As the subjects involved in the trial study seemed intent on obtaining a waveform with similar dimensions to the native speaker's example, this may lead to some frustration on the part of the learners as outside noise would be picked up in the student's recording. Students in large groups would therefore require the use of a specialised close vicinity microphone rather than the in-built one.

During the one-week period it was observed that most of the students were quite concerned about obtaining the same waveform as the native speaker. This lead to one student spending the entire 40 minutes

working in the Lessons module. It would therefore be necessary when implementing the software to ensure that students spent an equivalent amount of time in each part of the program, without placing too much emphasis on obtaining a perfect waveform.

Conclusion

The teaching of pronunciation is a task that lends itself to the use of CALL software. An array of multimedia applications can be utilized by the language learner as part of a structured language program or in a self-directed learning environment to enhance the study of L2 pronunciation development.

One of the major advantages of the interactive software is that students are no longer placed in a stressful situation in which they are forced to perform in front of their peers. They may work in an individual learning environment using visual and aural feedback in an attempt to improve phonological development in the L2. They also place themselves in a situation in which they have access to intensive instruction, something that is not possible in the average language classroom with large numbers of students.

Note: A shorter version of this article first appeared in Calling Japan 10(2), 2002.

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Appendix

Pronunciation Power 1

Student Questionnaire

Answer the following questions based on your experience after using Pronunciation Power 1. Be thoughtful in your evaluation of the software.

Use the following scale to respond to each question.

5- Strongly Agree

4- Agree

3- Undecided

2- Disagree

1- Strongly Disagree

1. The Air Flow Legend helped me to understand how to articulate sounds.

[1 2 3 4 5]

2. I found the Side View helpful in understanding how sounds are produced.

[1 2 3 4 5]

3. The Front View of speech production was useful.

[1 2 3 4 5]

4. The native speakers voices were clear and easy to understand and imitate.

[1 2 3 4 5]

5. The software helped me to learn the International Phonetic Alphabet (IPA).

[1 2 3 4 5]

6. The Speech Analysis waveform was useful for helping me to produce accurate sounds in the L2.

[1 2 3 4 5]

7. Recording and listening to my voice was helpful for learning pronunciation.

[1 2 3 4 5]

8. Comparing my voice with the native speakers voice was useful.

[1 2 3 4 5]

9. Listening to a male voice is helpful when studying pronunciation.

[1 2 3 4 5]

10. Listening to a female voice is helpful when studying pronunciation.

[1 2 3 4 5]

11. I found the Sample Words exercise useful for studying a particular sound in words.

[1 2 3 4 5]

12. Comparative Word examples helped me to hear the difference between two words.

[1 2 3 4 5]

13. Listening Discrimination A & B exercises were helpful for pronunciation practice.

[1 2 3 4 5]

14. I found the symbols used in the S.T.A.I.R exercise useful for improving stress and intonation in my speech.

[1 2 3 4 5]

15. Level 1 & 2 sentences in the Exercise module were useful for practicing selected sounds in complete sentences.

[1 2 3 4 5]

16. The Dictionary module was a useful component of the program.

[1 2 3 4 5]

17. I used the Dictionary module a lot.

[1 2 3 4 5]

18. I used the Dictionary to look up words I couldn't understand.

[1 2 3 4 5]

19. I used the Dictionary to look up particular sounds.

[1 2 3 4 5]

20. I used the Dictionary to find words with a particular grammatical function eg. verb, noun.

[1 2 3 4 5]

21. I used the Dictionary to find words in a particular theme.

[1 2 3 4 5]

22. The Dictionary contained useful graphics and sentence examples for words.

[1 2 3 4 5]

23. Listening Game 1 was useful for learning English vocabulary.

[1 2 3 4 5]

24. Listening Game 2 was useful for identifying the particular sound contained in a word.

[1 2 3 4 5]

25. Recording Game 1 was helpful for learning the spelling of words.

[1 2 3 4 5]

26. The graphics used in the Games module were clear and easy to understand.

[1 2 3 4 5]

27. The vocabulary used in the Games module was useful and appropriate.

[1 2 3 4 5]

28. I would like to use this software on a regular basis.

[1 2 3 4 5]

29. I think my L2 pronunciation would improve using this software.

[1 2 3 4 5]

30. How would you rate your overall satisfaction with this software?

Excellent

Very Good

Good

Satisfactory

Just Below Satisfactory

Poor

Very Poor