

Computer-Assisted Pronunciation Training: The Effect of Integrating Accent Reduction Software on Iranian EFL Learners' Pronunciation

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Abstract

This study aimed to investigate whether the introduction of accent reduction software in conversation classes at the university level would result in developments in EFL learners' pronunciation. The study made use of a quasi-experimental intervention design which consisted of control and experimental groups. Two classes at the Department of Foreign Languages and Linguistics at Shiraz University, Iran, participated in the study. While the control group followed traditional pronunciation training, the experimental group attended computerized pronunciation instruction which integrated a Farsi edition of the Accent Master software (Bo & Bo, 2005). Results of the study suggest that in EFL settings, where exposure to target language is quite rare, software programs can be perfect options to compensate for limited real life pronunciation practice. In conclusion, EFL learners can be provided with extra exposure to target language input and practice with specifically designed CAPT programs.

Keywords: Computer-assisted Pronunciation Training; pronunciation training; Accent Reduction Software; CAPT

Introduction

With the growing number of English speakers around the world, the English language has earned a prominent role as a means of communication cross-culturally, where nonnative speakers outnumber native speakers. Hence, pronunciation, as a principal component of oral skills and communication, has gained great significance at the global level. According to Fraser (2000), pronunciation is essentially one of the most influential aspects of language skills, in the sense that it helps learners be understood even if the grammar and vocabulary are limited.

Pronunciation pedagogy has undergone a great change by the emergence of modern technologies, eliminating some of its present limitations. As an example of such technologies, computer-assisted pronunciation training (CAPT) paved the way for teachers to provide enriched learning environments for their learners. As Pennington (1999) maintained, CAPT provides a great opportunity for English as a foreign language (EFL) students to assess and reduce their foreign

accent through focused training and self-monitoring. It plays a crucial role in foreign language learning contexts where exposure to native accent is quite scarce.

With the advantage of mechanical analysis of the individuals' inputs, CAPT programs can foster individualized diverse and comfortable virtual environments. Thereby, by raising learners' awareness of phonological features, CAPT maintains learnability of the target language sound system in adult learners. There is a wealth of useful accent reduction software available on the market which provides learners with both segmental and prosodic training as well as acoustic and visual feedback (Pennington, 1999).

A large body of literature (Celce-Murcia, Brinton, Goodwin & Grinner, 2011; Neri, Cucchiarini, Strik & Boves, 2002; Pennington, 1999) supports the notion that integrating CAPT into language courses can contribute significantly to promoting students' pronunciation competence with the gift of new technologies. Following this notion, the present study aims to investigate the effectiveness of CAPT on pronunciation instruction in a higher education context.

As teachers, the researchers noticed two major problems in pronunciation training at Iranian universities. First, there are many students who struggle with the English sound system and become discouraged and frustrated by its blurred intricacy. Secondly, there are not enough pronunciation studies conducted on Iranian learners' pronunciation of English, despite the abundant research on other language components such as grammar and vocabulary. Thirdly, pronunciation training has been disregarded and marginalized for years and limited to listen-and-repeat exercises. In fact, pronunciation instruction is not straightforward and needs to be refined. These gaps need to be filled to aid Iranian learners of English to reach their highest potential in mastering English pronunciation.

With the emergence of CAPT systems, stress free, self-learning environments have developed which can be integrated in English language courses in Iran to compensate for the limitations and lack of proper pronunciation instruction. The results of the present study may influence the defined educational policies regarding pronunciation instruction by suggesting that utilizing accent reduction software can improve adult Iranian EFL learners' overall pronunciation skills. It may also help to develop more appropriate accent reduction software specifically designed for Persian EFL learners.

Sounds are the heart of every language and they play a very prominent role in communication. Communication involves the mutual interaction between the speaker and the hearer. That is to say, the interlocutors must comprehend and produce the target language sounds accurately to exchange information (Gilakjani, 2012). Pennington & Zegarac (1998) claim that pronunciation plays a crucial role in the development of pragmatic competence, and that pronunciation errors can cause pragmatic misunderstanding.

Stress-timed and Syllable-timed Languages

Depending on timing, languages can be classified into two types; stress-timed and syllable-timed languages. In stress-timed languages, utterance length is determined by the number of stresses,

while in syllable-timed languages, utterance length depends on the number of syllables rather than stresses in the sentence (Bertran, 1999).

According to Celce-Murcia, Brinton and Goodwin (1996), learners of English whose native language is syllable-timed (like Farsi) have difficulty stressing the English syllables sufficiently and usually tend to stress syllables equally. Moreover, they stress all syllables without sufficient reduction of unstressed syllables. In other words, in syllable-timed languages (such as French, Farsi, many African languages, etc.) rhythm extremely depends on the number of the syllables within an utterance rather than the number of the stressed units. Therefore, English learners from syllable-timed language backgrounds are inclined to stress English syllables more evenly, lacking adequate stress to content words and lacking adequate reduction of the unstressed syllables. For this reason, many researchers believe that stress-timing is a prominent feature of English pronunciation and must be considered and included in designing the pronunciation curriculum (Celce-Murcia, Brinton, Goodwin & Grinner, 2011).

Computer Assisted Pronunciation Training

Learners need considerable chances to listen to their own speech and that of their peers and compare them with that of native speakers, and they should try to recognize the features of their pronunciation, which make it difficult for native speakers to comprehend their speech. Listening to one's own speech while they are speaking is not possible. As a result, it is crucial that learners and teachers have exercised on their recorded video or voices so that they could work on them as much as needed, and then those voices can be reviewed objectively. Computer technology makes this kind of recording and comparing quite convenient (Gilakjani & Ahmadi, 2011).

Some CAPT systems make use of methods such as speech recognition, speaker normalization and signal parameterization to present visible comparisons between students' attempts and the model. Other software can also display pitch traces by which students can compare and get immediate feedback on their pronunciation using visual graphs (Celce-Murcia, Brinton, Goodwin & Grinner, 2011).

Seferoglu (2005) examined the impact of integrating accent reduction software on Turkish advanced English learners at university. Two classes formed the experimental and control groups. The experimental group followed computerized pronunciation training while the control group followed traditional pronunciation instruction. The results of the study suggest that integrating accent reduction software could improve EFL learners' pronunciation. In the same vein, Dekaney (2003) and Al-Qudah (2012) found that employing CAPT can improve EFL learners' pronunciation. In a related study Kilickaya (2011) investigated the role of accent reduction and text-to-speech software for elementary EFL learners in Turkey. Three classes participated in the study. The first class (the control group) followed the traditional pronunciation instruction, the second class followed instruction which integrated accent reduction software and the last class followed instruction which integrated both accent-reduction and text-to-speech software. The results of the study suggest that the EFL learners who were trained by both accent-reduction and text-to-speech software improved more in terms of their pronunciation skills.

In addition, Wang and Munro (2004) attempted to investigate the impact of CAPT on learning English vowels. Sixteen Mandarin and Cantonese EFL learners improved in terms of perception and production of these sounds three months after training. The results of their study indicated that CAPT could enhance Chinese EFL learners' understanding of the vowel contrasts.

Likewise, Kawai and Hirose (2000) examined the role of speech recognition technology for teaching Japanese double-mora phonemes to speakers of other languages. They found that this technology could help the learners the phoneme durations and thereby monitor their progress. Gorjian, Hayati and Pourkhoni (2013) also explored the effect of CAPT (Praat software) in English prosody training. The findings of the study suggest that utilizing CAPT could significantly improve EFL learners' pronunciation, as far as prosody is concerned.

Through a distinguished study, Felps, Bortfeld and Gutierrez-Osuna (2009) introduced a new method of computerized foreign accent reduction, which provided the learners with prosodically and segmentally corrected versions of their utterances. They conclude that this technique can decrease foreign accentedness.

At present, few powerful CAPT systems are developed internationally that target different languages, and even fewer which target Farsi learners of English. To the authors' knowledge, only one software (Accent Master) is designed specifically for these learners.

Method

This study aims to investigate the effectiveness of CAPT on pronunciation instruction in a higher education context. It intends to examine the effect of the CAPT program on learners' English pronunciation proficiency and tries to examine its effects on different aspects of pronunciation such as vowel sounds, intonation and word stress. Two research questions are thus put forward:

1. Will the Iranian EFL learners' overall pronunciation skills improve after a period of CAPT?
2. In which aspects of the pronunciation skill (i.e., vowel sounds, diphthongs, consonants, end sounds, linking, word stress, sentence stress and intonation) do the Iranian EFL learners perform better after the CAPT intervention?

Participants

The study made use of a quasi-experimental, pretest-posttest control group research design. A convenient sample of 30 participants, 12 males and 18 females, was selected. All participants were Iranian English Literature freshmen of Shiraz University and native speakers of Persian, who participated in two intact conversation courses. Their age ranged from 18 to 45 years, with the mean of 20. Due to registration considerations, random assignment of the learners into experimental and control groups was impossible and as a result, one class formed our experimental group (16 students), and the other, the control group (14 students).

Materials

In this study, the researchers integrated a Farsi edition (the version specifically designed for Persian EFL learners based on the basic differences between Persian and English phonological features) of an accent reduction software, Accent Master (Bo & Bo, 2005) with the course. This software, as shown in Figures 1 and 2, provides learners with the following activities. The focus of the basic lessons is on 24 problematic sounds for Farsi speakers, which are practiced with the help of an animated front and side view of a speaker's mouth.

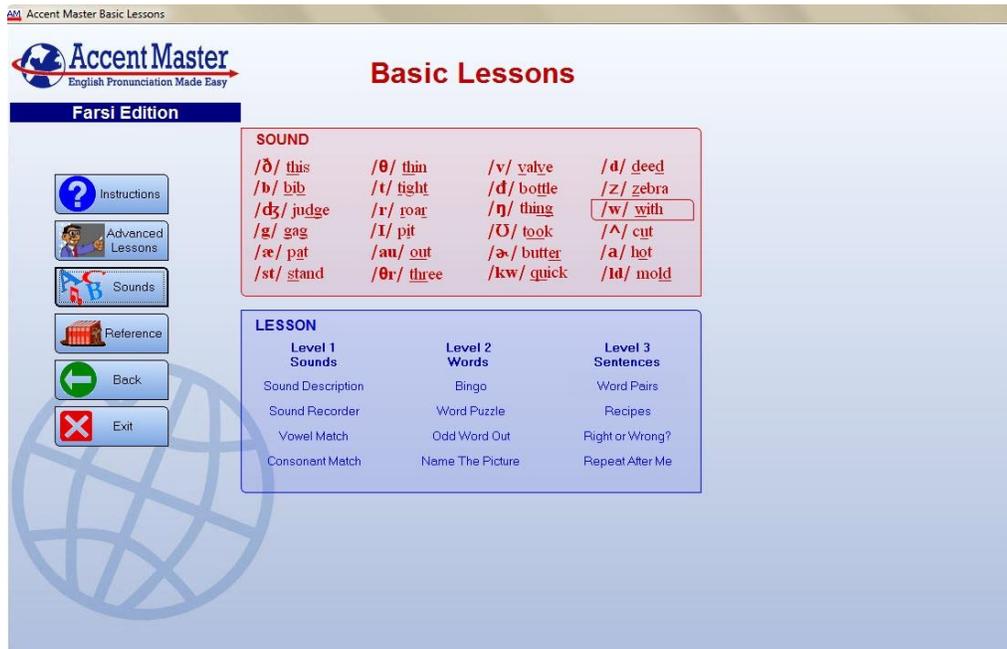


Figure 1. Basic lessons on problematic sounds

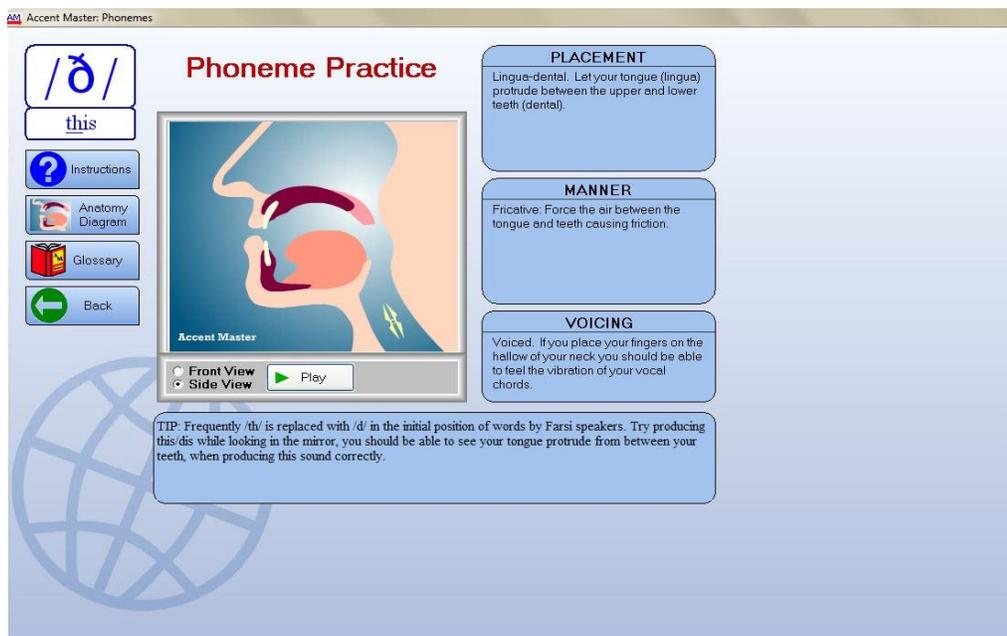


Figure 2. Front and side views of mouth pronouncing the selected sound along with explanations on placement, voicing and manner of articulation

As Figure 3 portrays, advanced lessons focus on suprasegmentals (such as word stress, sentence stress, intonation, linking) and different activities based on these pronunciation features.



Figure 3. Advanced lessons on suprasegmentals

This program has unique and special features such as videos of an authentic American speaker producing each sound, a visual sound comparison (also called pitch trace or intonation contours) which enable the learners to see their output in comparison to those of the model speakers, video instructions for advanced lessons, and a 52 American English phoneme library (see Figure 4). The users can hear American English speakers pronounce every practice sound, word, and sentence.

Accent Master
English Pronunciation Made Easy

Farsi Edition

Here is a list of the 52 sounds (also called phonemes) used in Standard American English. Next to each sound is a sample word. Click on a sound for a detailed description of how to produce that sound.

VOWELS

/æ/ pat	/i/ bee	/o/ boat	/ɔ/ caught
/e/ pay	/ai/ pie	/au/ out	/ə/ butter
/ɛ/ pet	/ɔi/ noise	/ʌ/ cut	/ɑ/ hot
/ɪ/ pit	/ʊ/ took	/ə/ about	

CONSONANTS

/b/ bib	/l/ lid	/t/ tight	/ŋ/ thing
/d/ deed	/m/ mom	/v/ valve	/ʃ/ ship
/f/ fife	/n/ no	/w/ with	/θ/ thin
/g/ gag	/p/ pop	/j/ yes	/ð/ this
/h/ hat	/r/ roar	/z/ zebra	/ʒ/ vision
/dʒ/ judge	/s/ sauce	/tʃ/ church	/d/ bottle
/k/ kick			

CLUSTERS

/kw/ quick	/ld/ mold	/pr/ price	/pl/ plane
/sm/ smile	/lt/ melt	/gr/ green	/kl/ clean
/st/ stand	/θr/ three	/fr/ frog	/bl/ black

Buttons: Instructions, Back, Exit

Figure 4. American English phoneme library

This software includes various lessons which work on both segmentals and suprasegmentals. As Figure 5 shows, by making use of different interactive pronunciation games such as Bingo, word-pairs and word puzzles, it creates a sense of fun for the learners.

Accent Master: Bingo

B I N G O

smooth	the	though	day	there
load	bathe	loathe	breathe	dough
teethe	math	soothe	den	weather
other	wreath	these	this	clothe
those	length	they	then	slither

Buttons: Instructions, Shuffle, Repeat Word, Back, Exit

Figure 5. Interactive listening and speaking games

It also allows the learners to record their voice and compare it to that of a native speaker with the help of a pitch trace. The pitch traces or the intonation contour, as shown in Figure 6, gives the students quick and objective feedback.

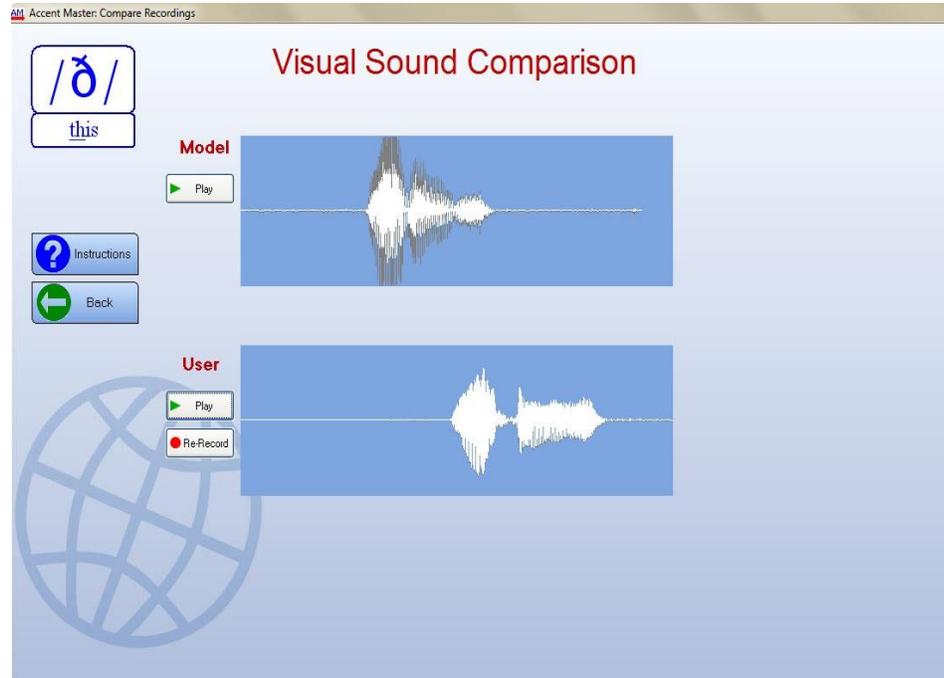


Figure 6. Visual comparison of waveforms of each sound or word with those models

In addition, it provides the learners with visual aids such as showing articulatory organs while pronouncing sounds (side view and front view) and helpful video instructions (see Figure 7). All lessons consist of various pronunciation training techniques at different levels (sound level, word level, sentence level). Above all, it could address the pronunciation problems of Iranian learners of English in its lessons.

Word Stress

Word Stress

Word stress refers to the manner in which we stress or emphasize a syllable in multi-syllabic words. We may stress a syllable by making the syllable longer or louder, though it is best to stress it through tone. This would mean to use a slightly different tone when producing the stressed syllable. You will have a chance to listen for this difference in the sample words and in the practice section.

We will be focusing only on stressed and unstressed syllables for clarity, however some words also contain a secondary or less stressed syllable as well.

American word stress most closely resembles that of

Instructions

Back

T
I
P
S

American word stress patterns are the result of the influence of many languages on American English. This leads to confusing word stress patterns with no accents to clarify matters. This area of English learning relies heavily on listening and developing an 'ear' or good ability to hear the speech music of English.

Figure7. Video instructions

Instruments and the Rating Scale

The instrument used to gauge students' pronunciation abilities was a Pronunciation Battery of tests designed based on the software specifications. PTB consists of three subsets, the focus of the first part being segmentals (vowels and consonant clusters) and word stress level, which requires the learners to read a list of problematic words. The second part was a reading aloud task (a text which is called diagnostic passage, including words with problematic vowels and consonant clusters and multi-syllabic words) which, according to Brown (2001), functions as a good indicator of the participants' pronunciation ability. The third phase was the oral reproduction of the content of a reading text which focused on suprasegmentals and prosody (elicited narrative task). Two experts in the field of phonology and pronunciation training reviewed the test and stated that the test enjoyed content validity and could measure different pronunciation traits properly. In order to check the reliability of the test used in this study, internal consistency was calculated. The Cronbach's alpha was found to be .98.

The students' tests were recorded so that they could be reviewed by different raters. Four raters (the researchers and a native speaker) scored the PTB based on a Moodle pronunciation rubric to avoid any possible subjectivity. Moodle pronunciation rubric made use of seven-point Likert scale ranging from 1 to 7 on different pronunciation aspects (i.e., vowel sounds, diphthongs, consonants, end sounds, linking, word stress, sentence stress and intonation). To ensure inter-rater reliability, Pearson product-moment correlation coefficients were calculated. A strong

positive correlation was found between the raters' pre-test and post-test scores, ($r=.81$, $N=30$, $p<0.05$)

Data Collection Procedures

The data were collected over four months during the first semester of the 2013-2014 academic year. The PTB was administered as a pre-test to examine and determine the students' pronunciation performance before the study. Members of the experimental group engaged in 10 weeks of CAPT training, while the control group followed the traditional instruction. Each student in the experimental group worked with the accent reduction software (Accent Master) for two sessions a week, each session taking about half an hour in a private stress-free laboratory, instructed by the researcher on a one to one basis. Each participant had about 10 hours of instruction mediated by the software. Both groups were exposed to the same total amount of pronunciation instruction. According to Celce-Murcia, Brinton, Goodwin and Griner (2011), the pronunciation syllabus had to be fit into the problematic areas. Thus, the program syllabus was designed based on the most problematic areas of pronunciation for Farsi speakers and software lessons and features (such as vowel sounds, intonation, linking, and word stress). Two experts in the field reviewed the syllabus to ensure its applicability and adequacy. Eventually, to administer the post-tests, all learners took part in PTB again.

The results of the pre-test and post-test, as measured based on the Moodle pronunciation rubric that is a 7 points Likert scale, were compared and analyzed using independent samples t-tests. Paired-samples and independent samples t-tests were run to compare the differences between the post-test scores of the experimental and the control groups. A one-way, between-groups, multivariate analysis of variance was performed to investigate which traits of pronunciation skills of students (i.e., vowel sounds, diphthongs, consonants, end sounds, linking, word stress, sentence stress and intonation) improved more after CAPT.

Results

The analysis of the collected data revealed that there was a mean difference between the experimental group's scores ($M=24.68$, $SD=10.95$) and those of the control group ($M=23.78$, $SD=9.48$) on the PTB pre-test. To investigate whether this mean difference was statistically significant, an independent-samples t-test was run. As Table 1 suggests, the means obtained by the experimental and control groups on the PTB pre-test were not statistically different ($t(28)=.23$, $p>0.05$).

Table 1. Independent-samples t-test comparing the experimental and control group's performance on the PTB pre-test

TEST	Group	N	M	SD	t	df	Sig
PTB pre-test	Ex	16	24.68	10.95	.23	28	.81
	Co	14	23.78	9.48			

$p<.05$

Regarding the results of the PTB post-test, according to the results, the experimental group ($M=36.00$, $SD=9.93$, $n=16$) outperformed the control group ($M=25.07$, $SD=12.42$, $n=14$). In order to compare the difference between the post-test pronunciation scores of the experimental and control groups and assess the efficiency of the CAPT program, another independent-samples t-test was run.

Table 2. Independent-samples t-test results comparing the experimental and control group's performance on the PTB post-test

TEST	Group	N	M	SD	t	df	Sig
PTB post-test	Ex	16	36.00	9.93	2.61	28	.01*
	Co	14	25.07	12.42			

* $p<.05$

As Table 2 presents, the mean difference between the experimental group and the control group on the PTB post-test was found to be statistically significant ($t(28)=2.61$, $p<0.05$). In order to gain insight into possible differences between the performances of the two groups, the effect size (Cohen, 1988) was calculated and found to be large ($d=.19$).

Further analysis of the collected data revealed that there was a mean difference between the performance of the experimental and control groups from pre-test to post-test. In order to compare the pronunciation performance of each group individually before and after the treatment, paired-samples t-tests were run. As Table 3 suggests, the performance of the control group on the pronunciation competence pre- and post-tests was not statistically significant ($t(13)=-1.17$, $p>0.05$). However, the mean difference of the experimental group's performances in the pre- and post-tests were statistically significant ($t(15)=-10.92$, $p<0.05$), with a large effect size of ($d=0.88$).

Table 3. Paired-samples t-test comparing the experimental and control group's performance on the PTB pre- and post-tests

TESTS	Group	N	Mean	SD	t	df	Sig
PTB pre-test-	Ex	16	24.68	10.95	-10.92	15	.00*
PTB post-test	Ex	16	36.00	9.93			
PTB pre-test-	Co	14	23.78	9.48	-1.17	13	.26
PTB post-test	Co	14	25.07	12.42			

* $p<.05$

To investigate and determine the effect of CAPT on aspects of the pronunciation skill of the experimental group, a one-way Multivariate Analysis of Variance was performed. Eight dependent variables were included: vowel sounds, consonants, diphthongs, end sounds, linking, intonation, word stress and sentence stress. The independent variable was the CAPT intervention. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted.

As Table 4 presents, the results of the one-way MANOVA revealed a significant multivariate main effect for the experimental group's pronunciation post-tests, ($F(8,23)=4.20$, $p<0.05$), and the effect size was found to be large ($d=.59$).

Table 4. Multivariate test of significance for the experimental group's PTB pre and post-tests for the eight pronunciation aspects

	Value	F	Hypothesis df	Error df	Sig.	d
Pillai's trace	.594	4.20	8	23	.003*	.59

* $p<.05$

Since a significant multivariate main effect for pronunciation was obtained, for the univariate F tests, each dependent variable was focused on to see if the two independent variables (intervention and its absence) had a significant impact on them.

To come up with an experiment-wise alpha rate, a Bonferroni alpha adjustment was run and the alpha level (.05) was divided by eight to reach an acceptable confidence level for each of the eight tests (Pallant, 2007). Therefore, the adjusted alpha level would be $p<.006$.

As Table 5 shows, significant multivariate main effects were obtained for vowel sounds ($F(1,30)=11.33$, $p<.006$, $d=.27$), consonants ($F(1,30)=15.18$, $p<.006$, $d=.33$), end sounds, ($F(1,30)=9.11$, $p<.006$, $d=.23$), and linking, ($F(1,30)=9.84$, $p<.006$, $d=.25$). An inspection of the mean scores and multivariate main effects indicated that the experimental groups' post-test scores were slightly higher in some traits. Vowel sounds, ($M=4.43$, $SD=1.31$), consonants, ($M=5.06$, $SD=1.23$), end sounds ($M=4.68$, $SD=1.13$) and linking ($M=4.56$, $SD=1.26$) were slightly higher than other pronunciation traits such as diphthongs, intonation, word stress and sentence stress after the intervention.

Table 5. One-way MANOVA on tests of between-subjects effects for the experimental group on PTB pre-test and post-test scores

Pronunciation aspects	df	MS	F	Sig	d
Vowel Sounds	1	19.53	11.33	.002*	.27
Consonants	1	26.28	15.18	.001*	.33
Diphthongs	1	13.78	5.25	.029	.14
End sounds	1	16.53	9.11	.005*	.23
Linking	1	18.00	9.84	.004*	.24
Intonation	1	11.28	5.42	.027	.15
Word Stress	1	16.53	8.07	.008	.21
Sentence Stress	1	9.03	6.34	.017	.17

* $p<.006$

Discussion

As stated earlier, the first research question addressed the effectiveness of pronunciation teaching through utilizing CAPT technologies. More specifically, it asked if the Iranian EFL learners' pronunciation skills (i.e., vowel sounds, diphthongs, consonants, end sounds, linking, word stress, sentence stress and intonation) improved after a period of CAPT.

The answer to this question, as the results revealed, is that the learners improved in terms of pronunciation proficiency after the CAPT intervention. The experimental group's scores were significantly higher than those of the control group. As the results of the t-test of the pronunciation battery pretests showed, learners in both groups mostly had an acceptable communicative ability in their English pronunciation. However, after ten weeks of CAPT training, the learners in the experimental group developed higher pronunciation proficiency.

Despite the shortage of literature in the CAPT realm, this finding was found to be in line with the previous studies done (e.g., Gorjain, Hayati and Pourkhoni 2013; Al-Qudah 2012; Kilickaya 2011; Felps, Bortfeld and Gutierrez-Osuna 2009; Seferoglu 2005; Wang and Munro 2004; Dekaney 2003; Kawai and Hirose 2000) on the area of integration of accent reduction software as an effective tool in English programs. They found that integrating CAPT in English programs in EFL settings resulted in better English pronunciation. Moreover, there is strong evidence in the literature (e.g., Pennington 1999) that integrating technology in English programs will provide learners with a great opportunity to engage in pronunciation learning processes in an individualized, stress free and private environment. Additionally, CAPT programs help students to involve more in the process of learning pronunciation and can raise their awareness to discern the target language pronunciation distinctions with those of their mother tongue.

In short, Accent Master uses useful and practical materials that altogether make it an acceptable instructional technology for being integrated into the English programs, particularly in EFL settings where exposure to target language pronunciation is quite scarce. All these software features contribute to the improvement of adult Iranian EFL learners' pronunciation at the university level.

The second research question, attempted to discover the aspects of the pronunciation skill (i.e., vowel sounds, diphthongs, linking, intonation) in which Iranian EFL learners performed better after the CAPT intervention. As the results of the analysis show, learners' vowel sounds, consonants, end sounds and linking improved slightly higher than other traits such as diphthongs, intonation, word stress and sentence stress after the intervention.

To the authors' knowledge, no study has so far examined the effects of integrating accent reduction software on English pronunciation traits individually. The results revealed that CAPT lessons are more effective for the improvement of vowel sounds, consonants, end sounds and linking sections, at least for Farsi learners of English. Furthermore, they suggest that despite the learners' overall improvements in pronunciation, the software lessons on diphthongs, intonation, word stress and sentence stress could not strongly address and meet Iranian EFL learners' needs and should be either revised or expanded. Another possible interpretation of the results is that Iranian EFL learners need to work more on English supra-segmentals, because they seem to be

more difficult and challenging for them to acquire and hence cannot be significantly improved in a 10-hour instruction period. Mehrpour and Makki (2011), Setter (2006), Anderson-Hsieh and Venkatagiri (1994) and Todaka (1990) also found that supra-segmentals were challenging for EFL learners from Iran, Hong Kong, China and Japan, respectively.

Likewise, Celce-Murcia, Brinton, Goodwin and Griner (2011) held that learning English rhythm patterns (which consist of word stress, sentence stress and intonation units) are quite demanding for EFL learners who are from syllable-timed language backgrounds. As stated earlier, Farsi is a syllable-timed language and its pattern of stressed elements is the function of the number of the syllables in the utterance. These distinctions make it challenging for Iranian learners of English to learn the stress patterns which dominate the English language. They usually tend to stress English monotonously without exerting sufficient emphasis on stressed elements and without reducing the unstressed syllables appropriately. The process of learning this new rhythm pattern can thus be quite demanding and time-consuming.

Nonetheless, until recently, in most EFL settings these supra-segmental features and intonation patterns have been ignored in the ESL classroom and have become more demanding to learn. Accordingly, most of the students transfer their native language sounds and stress patterns, bringing about a form of speech which is hard to understand.

Conclusion

Based on the results of the study, it is suggested that CAPT can provide an enriched pronunciation environment for adult learners, especially in EFL contexts where exposure to target language pronunciation is considerably rare. Integrating CAPT into English programs could change the learning environment by individualizing the pronunciation instruction so that learners could properly concentrate and work on the problematic parts of their pronunciation. This actually justifies the prominence and importance of explicit pronunciation training, specifically in EFL settings.

As Canagarajah (1999) pointed out, non-native English speaking teachers comprise up to 80% of all English teachers universally. This does not mean, however, that teachers should be native speakers to be capable of teaching pronunciation. It rather means that they ought to be suitable models for their learners by selecting the problematic areas of pronunciation and helping their students with suitable instruction, using accurate techniques, tools and technologies to overcome their pronunciation learning barriers. Technology in general, and accent reduction software in particular, are among the most effective tools that can assist teachers to help learners enhance their pronunciation. The ideal accent reduction software should address and account for the learners' native language as well as the target language specifications so that it can raise the learners' awareness to distinguish these features and distinctions and in so doing, help them to produce more intelligible and comprehensible pronunciation. It is essential that teachers enhance their knowledge in the area of pronunciation training and utilize appropriate techniques, tools and technologies to improve their learners' pronunciation competence. It is also important to note that pronunciation research and training should concentrate on both segmentals (vowels and consonants) and supra-segmental aspects of the language.

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