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UNIVERSITY COLLEGE OF
ENGINEERING & TECHNOLOGY
MALAYSIA

**KOLEJ UNIVERSITI KEJURUTERAAN & TEKNOLOGI
MALAYSIA**

**PRONUNCIATION REPAIR: DECREASING PHONEMIC MISPRONUNCIATIONS
BY THE MALAY ESL SPEAKERS USING PRONUNCIATION SOFTWARE**

**PENGGUNAAN "PRONUNCIATION SOFTWARE" DALAM MENANGANI KESI-
LAPAN PENYEBUTAN FONEME OLEH PENUTUR BAHASA INGGERIS SEBAGAI
BAHASA KEDUA.**

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ABSTRACT

The study focuses on one of pronunciation elements, which is the production of phonemic correctness. The subjects involved are Malay ESL speakers and the aims are to identify the most common consonant mispronunciations committed by these speakers and to use pronunciation software, which is the Pronunciation Power developed by English Computerized Learning Inc. (ECL), to correct the errors. The purpose of using the software is to see the effectiveness in assisting learners in the learning process. Based on the research done on 300 initial participants, it is found that the common mispronounced consonants among Malay ESL speakers are /ʒ/, /θ/ and /ð/, which do not exist in the first language phonological system. Once the mispronunciations are identified 20 participants were selected to go through a 30-hour treatment using the software. By the end of the session, most of them managed to self-correct the errors in their controlled speech. However, in natural speech setting, the mispronunciations persist. By carrying out this study, it is the expectation of the researchers that some insights can be provided for further research. Furthermore, findings gathered are also hoped to contribute to the development of academic syllabus to be implemented as an elective course that educators in the university can offer to the students as an enhancement in learning second language.

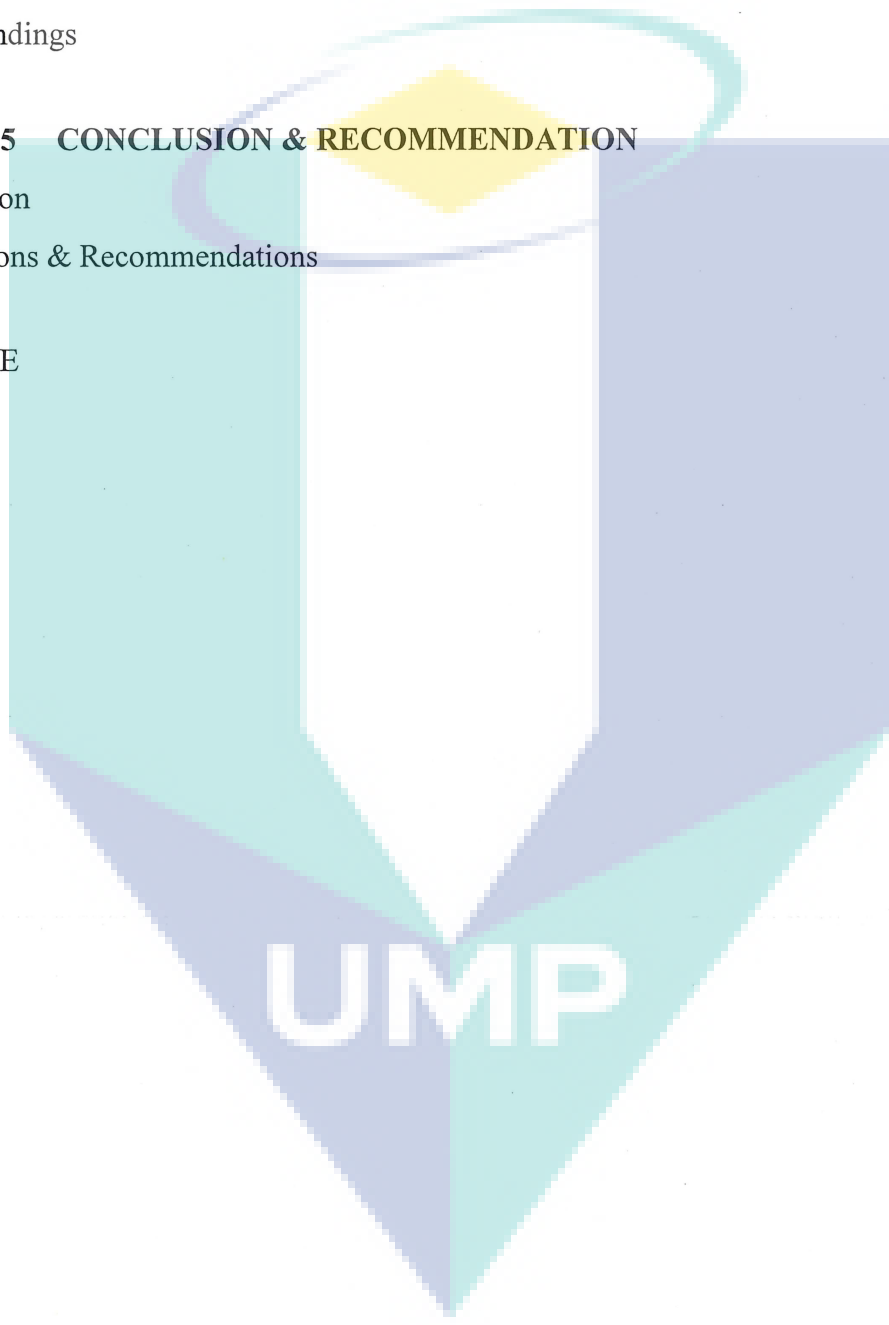
The logo of Universiti Malaysia Perlis (UMP) is a large, stylized letter 'V' shape. The left side of the 'V' is light blue, the right side is light purple, and the bottom point is a darker blue. The letters 'UMP' are written in white, bold, sans-serif font across the center of the 'V' shape.

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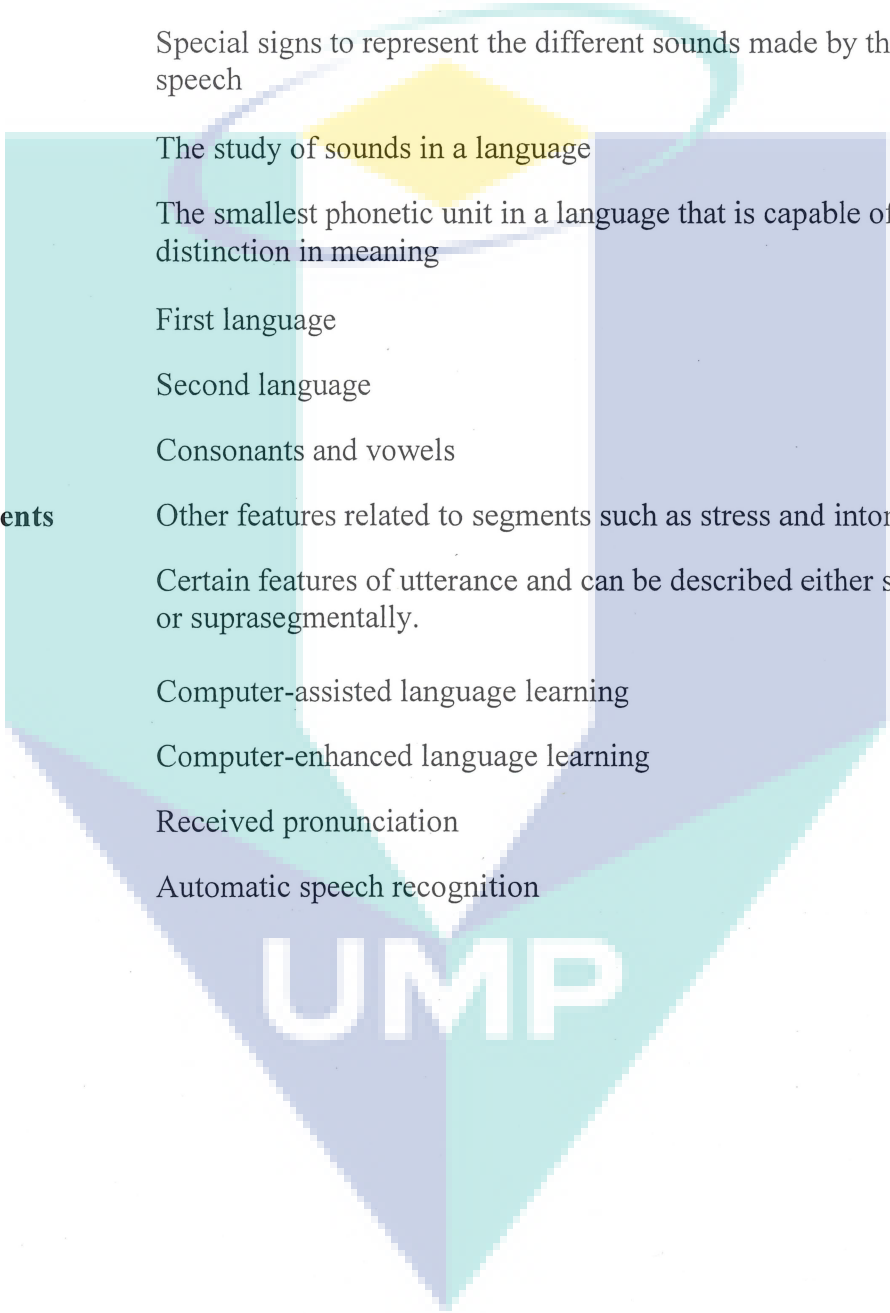
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LIST OF CONCEPTUAL DEFINITION



ESL	English as a second language
EIL	English as an international language
IPA	International phonetic alphabets
Phonetic	Special signs to represent the different sounds made by the voice in speech
Phonology	The study of sounds in a language
Phoneme	The smallest phonetic unit in a language that is capable of conveying a distinction in meaning
L1	First language
L2	Second language
Segments	Consonants and vowels
Suprasegments	Other features related to segments such as stress and intonation
Prosody	Certain features of utterance and can be described either segmentally or suprasegmentally.
CALL	Computer-assisted language learning
CELL	Computer-enhanced language learning
RP	Received pronunciation
ASR	Automatic speech recognition

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CHAPTER 1: INTRODUCTION

1.0 Statement of the Problem

The ability to communicate effectively relates to clear pronunciation of the message articulation. To produce phonemic correctness is one of the main features of pronunciation in English. Fraser (1999) mentions that learning pronunciation is seen as a crucial element in improving language learning. Among the importance of having the correct pronunciation would be to develop “functional intelligibility, communicability [and] increased self-confidence” (Fraser, 1999, p.3).

In a context where English is spoken as a second language, pronunciation problem tends to occur and sometimes might distort meanings. Some Malay ESL speakers are having problems in pronouncing English words correctly, thus, lead to misunderstanding or inability to comprehend what is being said. Laurel Dabria (2003) asserts that it is vital to have clear pronunciation because frequent misunderstandings due to this weakness will result in continued problems, “lowered job satisfaction and effectiveness, and costly errors. This will ultimately cost a person's professional advancement” (p. 1). It is also stated that the first language (L1) influence contributes to some occurrences of mispronunciation. Therefore, some linguists believe that by reducing the influence of L1 phonetic interference, ESL speakers will be able to learn the target language system better. It is obvious to some extent that L1 influence should not be undermined and in correcting mispronunciations it should not be put at marginal so as comprehensive consideration on the aspects of pronunciation repair can be done.

One of the aims of universities in Malaysia is to produce graduates who are marketable. To achieve this, communication competency is considered as one of the essential criteria in enhancing the level of employability of the graduates. Pronunciation is essentially part of the package and it is definitely one of the important traits where verbal communication is concerned.

Even though pronunciation includes many phonetics and phonological aspects such as stress, intonation, rhythm, and pacing, this study will only focus on the phonemic correctness of the speakers. The process of decreasing phonemic mispronunciations will include using the software as the tool for researchers to assist participants. By having both audio and visual aids, it is hoped that the learning process will be more interesting and effective.

In order to meet the needs of today's urge on computer literacy, educators have been for decades trying to use, create and enhance the technology to teach and train. In language classes, computerized materials are undeniably helpful in making the lessons to include students actively in the learning process. Teaching pronunciation is one of the areas where the availability of audio, visual and interactive technological aids is much welcomed. With computers, both learners and teachers have their own space to immerse and catch up with the process especially if we are talking about student-centered learning (SCL) classroom. In other words, within the subtle control of the instructors, learners can set individual pace of learning. Computers are there to fall back on, if he or she is left behind. There will always be a chance to revise on their own, without distracting other learners.

Teaching pronunciation especially, audio and visual aids are essentially useful in making the lessons more effective. Teachers cannot be all the time accurate and consistent in sound production. Pronunciation software makes teaching pronunciation much easier. Learners can see the inside of the mouth and how the teeth, tongue and palate are positioned in the different sound productions. The question is how effective is the use of the software in the learning process. Apart from identifying common phonemic mispronunciations and making an attempt to repair those mispronunciations. The kind of materials available in the software is also discussed to see how effective can they be in teaching students pronunciation. It is also in the consideration that recommendation for enhancement of the software in view of the content and materials can be made at the end of the study.



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1.1 Research Questions

The study was designed to investigate the following research questions:

- 1.1.1 What are the most common phonemic mispronunciations that occur among speakers of English as a second language (ESL)?
- 1.1.2 How effective is the pronunciation software in assisting the correction of the mispronunciations identified?

1.2 Objectives

The present study sought to accomplish these aims:

- 1.2.1 To identify the most common phonemic mispronunciations.
- 1.2.2 To repair phonetically the mispronunciations identified.
- 1.2.3 To utilize and determine the effectiveness of the pronunciation software in assisting ESL speakers learning.
- 1.2.4 To identify findings that can be utilized for enhancement for students development.

1.3 Organization of Chapters

The paper is divided into five sections. The first chapter outlines the introduction, which includes statement of the problem, research questions and objectives. Chapter two reviews the literature on related and relevant subjects which includes literature of previous studies in areas related to the present research. Chapter three explains the methodology adopted in carrying out the investigation. The classification of methodology will take into account the setting, population, subjects, sampling procedures, treatment of data, analysis of data and limitations of the study. Chapter four of the study will describe the findings based on the analysis of data. Finally, chapter five will conclude the paper and give some suggestions in related areas.

CHAPTER 2: REVIEW OF LITERATURE

2.0 Introduction

A significant body of literature exists in the fields of pronunciation and the use of computer software in the teaching process. This chapter will review several related studies carried out in various context and settings under two main headings, namely, mispronunciations that occur among ESL speakers and the use of pronunciation software in correcting mispronunciations.

2.1 Mispronunciations among ESL Speakers.

Researchers in pronunciation believed that mispronunciations that occur can distort message and lead to communication breakdown. In 1990, Fatimah Adelina Sastrawidjaja in her paper wrote that mispronunciations that occurred in a heavy foreign accent caused misunderstanding. To some extent, for students, it can retard the learning process (p. 28). From her findings she had identified some mispronunciations committed by her subjects who were all Malay native speakers. These subjects were students and they used English as their second language. One of her findings described that her subjects mispronounced the alveolar /d/. She claimed that Malay speakers pronounced it as dental sound (p.65). However, based on the study carried out with 300 Malay ESL speakers, all participants pronounced /d/ as alveolar phoneme, not dental.

Another finding that she explained was most subjects substituted labial dental sounds with bilabial sounds. The sounds /f/ and /v/ were substituted with /p/ and /b/ respectively. But, with regards to the present study, her findings proved to be totally wrong. Out of 300 recordings done on Malay ESL speakers, none committed such error in their pronunciation.

Sastrawidjaja also stated that some of her subjects tend to substitute /z/ with /dʒ/, which was also not proven in the current study (p.94). The subjects in current study did not have problems in pronouncing /z/ as prescribed in Received Pronunciation (RP). In general, after carrying out the present study, many of Sastrawidjaja's findings turned out to be inaccurate.

Ding Huong-Doh (1968) claimed that mispronunciations occurred due to phonological interference of the mother tongue. Sounds that do not exist in the first language will create problems for second language speakers. However, Huong-Doh's list of sounds that do not exist in the Bahasa Melayu's (BM) system was refutable. Sounds like /b/ and /s/ were stated as non-existent at the final position in the BM phonological system (p.19). This is not true since there are words which have these sounds as final positions like 'adab' /ʌdʌb/ and 'kemas' /kəməs/. Therefore, these phonemes do exist in the BM system and did not lead to any mispronunciations among the Malay ESL speakers.

Research in other countries, like Korea, looked at pronunciation in a communicative competence scope. Good or bad pronunciation was measured by understandability, fluency and syntactic. Robertson (2002) believed that mispronunciations occurred due to influence of the speaker's first language (L1) and the rate of speech. The faster someone speaks, the more errors the speaker will make (p. 8). He looked at pronunciation as very much related to the culture of the speakers. Therefore he asserted that students, in particular Asian, should practice with "identifiable areas of speech". These included "specific complex sounds, cluster problems, th' /θ/ words, and linking words and sounds". Generally, his study on Korean subjects possessed a wider scope as compared to the present study.

This paper which focused only on phonemics of pronunciation agrees with his notion of /θ/ in words as one of the mispronunciations occurred and needed to be corrected. Almost all

participants involved in the recording mispronounced /θ/ in words clearly. As stated by Huong-Doh, sounds that do not exist in L1 tend to be mispronounced. In this case, the study has proven that the statement is indeed true; the sound /θ/ does not exist in BM phonological system.

In Japan, holistic approach was taken when it came to pronunciation. This meant pronunciation was taken into consideration as part of communicative language learning. Previously, teaching pronunciation was considered not very successful. The focus was more on stress. Mispronunciations that occurred due to L1 influence were overlooked. Japanese is a language of syllable-timed, in contrast to stress-timed English. According to Yoshio Okita (1999), it was found out that there were many transfers of phonological features of Japanese into English pronunciation. One of them was in linking where the speaker connected adjacent words and pronounced in a continuous flow from one word to another. For Japanese speakers speaking English, they tend to commit epenthesis. An example given was the sentence “Look at the red doll”. For Japanese open syllable speakers, all of the final consonants were pronounced with an additional vowel. The transcription is /lʊkʊ etəw də redə dɔlə/. This phenomenon is often found among English learners whose native tongue is mainly open-syllabled. This happens because in syllable-timed language system, linking is used to distinguish different consonant sounds.

The present study also looked at this issue because Malay is also mostly syllable-timed language. However, almost all participants did not transfer the pronunciation of L1 into English except for five distinguished phonemes; /θ/, /ð/, /ʒ/, /æ/ and /eɪ/, where substitution occurred. Basically, in Malay, epenthesis, or additional vowel sound to a word does not exist. Thus, linking, for Malay ESL speakers is not a problematic feature in learning the pronunciation of English.

In the West, the believe that mostly, problems in pronunciation of second language is due to L1 interference is shared by many researchers. With regards to the study, observation showed that Malay ESL speakers did not regard this matter as the main problems. This only becomes a hindrance for some isolated sounds. However, even though it is not a major problem, to some extent, these isolated mispronounced sounds may become a hindrance to intelligibility in pronunciation.

A research done on Venezuelan subjects, whose first language is Spanish, depicted the L1 influence very conspicuously. Obediente (1991) mentioned that the common error of pronunciation caused by phonetic interference occurred with the phoneme /s/ which, when in syllable and word final position in Venezuelan Spanish, is pronounced [h], for example “este” [e^hte] (p.31). Therefore, for many Venezuelan this L1 interference made the speakers to encounter some difficulties in English pronunciation, especially the ones related to the identified phonemes. In some cases, this difficulty influenced the intelligibility of communication in general. According to Goilo (1979), the pronunciation of the English phonemes /p/, /b/, /t/, /d/, /k/, /g/, /f/, /ð/, /s/, /dʒ/, /tʃ/, /m/, /n/ and /l/ was especially difficult for Venezuelan Spanish speakers learning English in word and syllable final position.

In relation to the present study, subjects chosen did not show any problems pronouncing /p/, /b/, /t/, /d/, /k/, /g/, /f/, /s/, /dʒ/, /tʃ/, /m/, /n/. The similarity is only with the phoneme /ð/. When it came to this sound, mispronunciation was observed to occur in all positions of a word. Again this goes back to the fact that this particular sound does not exist in BM phonological system.

Michael Vaughn-Rees (2001) stated that “consonants are top priority; mistakes in vowels are not so problematic.” This statement begs the questions whether the corrections made on

the consonantal sounds may improve pronunciation in communication in general. Nevertheless, the current study adopting the same belief, carried out research focusing on mostly consonant mispronounced phonemes. Based on observation, mispronunciation of vowel sounds occurs due to dialectal interference of L1, not because of standard L1 interference on learning the second language phonological system.

Mispronunciations in phonological system had been vastly studied. One main reasons why many researchers put so much interest in this area is because there is a need to remedy this problem. In many cases, interference of mother tongue or L1 is seen to be the main influence. The extent to which this interference retard or assist pronunciation varies from one language to another. The paper focused on only one group in Malaysia, that is the Malay ESL speakers whose first language is Bahasa Melayu and this research chose one area of pronunciation, which was phonemic mispronunciations. As many studies previously carried out, the findings on mispronunciations were used to give some insights on the correction process. It was also the aim of this study that technological assistance is to be utilized in the process.

2.2 The Use of Pronunciation Software.

The existence of computer assisted language learning software and courseware has evolved language teaching in many different ways. That includes involvement of teachers in the teaching process and the participation of students in the learning process. Pronunciation is an area that computer assisted approach is very much researched on and it is moving on a very fast pace. The present study looked at the use of a software in correcting mispronunciations that were committed by Malay ESL speakers.

In other parts of the world, many researchers studied the use of many kinds of software and saw the effectiveness in the use of the software to teach, correct and enhance pronunciation skills among learners. Egbert (2004) reviewed “Connected Speech” pronunciation software produced by Protea Textware Limited. This software included regional accented English namely North American, British and Australia with target audience of 10 years and above. The accents used were with the aim of providing the target audience authentic samples, as Fraser (1999) asserted that “pronunciation teaching and learning must be situated in communicative contexts” (p.2).

The way the software was supposed to be applied in classroom, made teachers as facilitators and not as corrector or “ultimate speech model” (Egbert, 2004). Fraser (2000) had specified certain traits that should accompany a pronunciation software. He mentioned that a software should be of a “high quality, effective materials, especially computer-based materials with audio demonstrations, for learners of ESL pronunciation” (p.2). Chun (1998) commented on the authenticity of speech samples included in the software. She believed that speech samples should be presented within the cultural context of the learners. This way, attention of the learners was focused on specific features of pronunciation.

In the present study, the software used was developed by English Computerized Learning Inc. (ECL). The International Phonetic Alphabet (IPA) symbols in the software are of American accent. The speech samples and practices require learners to produce American pronunciation. Unlike Chun’s suggestion on culturally authentic speech samples, obviously this software does not meet that criteria. Some of the things that the software manages to do is to provide not only audio support material but also visuals of isolated sound production.

Connected Speech software came up with a computerized material that included

authentic speech samples in mostly natural discourse. In this case, the software used the voice of nine people with different North American regional accents. The three-level materials in the software provided information and stories to the learners in natural conversations. However, despite the claim that discourses included in the software were not scripted, the speech sounds “unnaturally fluent and slow” (Egbert, 2004). It was however, claimed to possess strength in the comprehensiveness in providing learners with chances to have thorough practices in both segmental and suprasegmental features. Similar to the software used in the present study, the percentage of practices was emphasized more on producing pronunciation which was more suprasegmental in nature.

The extensiveness of practices on prosodic features of pronunciation that included stress, timing, articulation, intonation and rhythm is similar to the Protea’s Connected Speech software. However, as the one used in the present study, the effectiveness of having this feature does not relate to being able to correct any isolated mispronunciations. The function of this element is to expose and require learners to learn the pronunciation of the language as a whole, regardless of certain phonemic mispronunciations.

Both software were developed to supposedly enable learners to interact “intelligibly”. This intelligibility was one of the focuses of Protea’s Connected Speech software. With regards to the Pronunciation Power software, intelligibility in speech featured may mean intelligibility with the use of American accent. However, Jennifer Jenkins (2000) proved that pronunciation has evolved and the meaning of intelligibility does not always involve being able to sound like British or American very closely. It now considers the wider use of English by people all around the world. This include native speaker as well as non-native speaker of English talking to another non-native speaker (p.69). Furthermore, Darhower (2002) noted that the

intelligibility which was prescribed in the Protea's software can sometimes be unreliable. He meant this in relation to other elements of discourse, besides intelligibility in suprasegmental production of speech. This was to take into account the grammatical and semantics plausibility of the speech. As Egbert (2004) pointed out in his review, this was one limitation that was consistently found in many pronunciation software where intelligibility was concerned.

Ehsani & Knodt (1998) stated that the use of Computer-aided language learning materials was fast growing to be in demand due to the shift of traditional grammatically-focused language learning to the emphasis on communicative competence. One of the main functions of such material should provide opportunity “for controlled interactive speaking practice outside the classroom” (p. 1)

This can be done by having materials that allow self-study where learners can learn at their own pace, while replacing teachers with computer-based interaction. However, many “social” expectations are voiced out by educators and researchers on the functions and effectiveness of the software to be used. The requirements that a software needs to fulfill mostly relate to the sociolinguistic elements of communication such as appropriateness in spoken output and characteristics that should take into account the “full complexity of human language” (Salabery, 1996, p.11).

The use of speech technology increases the number of software produced for learners to learn, especially the pronunciation of any second language at their own pace and time. Ehsani & Knodt (1998) evaluated on the use of automatic speech recognition (ASR) and speech processing technology in CALL. In this case, they looked at applications that provided “voice-interactive capabilities” and how these were integrated in technical and pedagogical design of the learning process. The main principle of ASR technology is to get response—in written or

action— that matched the expectations of the speaker. Thus, such technology had to possess the ability to understand human language with considerations of phonological, lexical, semantic, grammatical and pragmatic elements. This is the controversial demands that human place on computers where communicative competence is concerned.

Obviously, the applications of ASR technology in pronunciation teaching and learning is of the more advanced level compared to the Pronunciation Power used in the present study. One of the things that can be considered similar is the speech recognition in the speech analysis section. This however, focuses only on isolated phonemic production, not interactive or a more stringed-speech production usually occurs in conversation. The software manages to recognize the sound production and provide feedback in terms of accuracy through delineated sound pattern graph

ASR technology has been evolving since 1970s. One of the implementations included the use of Hidden Markov Modelling (HMM) (Levinson & Liberman, 1981). According to Bernstein & Franco (1996)

HMM-based modeling applies sophisticated statistical and probabilistic computations to the problem of pattern matching at the sub-word level. The generalized HMM-based approach to speech recognition has proven an effective, if not the most effective, method for creating high-performance speaker-independent recognition engines that can cope with large vocabularies; the vast majority of today's commercial systems deploy this technique (p. 6).

With this application, many researchers come up with systems that try to address the issue of human-machine interface design. Currently, the use of Voice-interactive tutor is becoming a trend in pronunciation training. This application is able to provide segmental feedback to the

learners through the recognition and evaluation of dysfluency in the speech of the learner. In the European Community a project called SPELL exploits the ASR technology using the HMM application to come up with an automated assessment and improvement of foreign language pronunciation. The system is able to provide immediate corrective feedback made based on the assessment on the pronunciation errors. This is possible by having knowledge about “systematic pronunciation errors” usually committed by second language adult learners (Hiller, Rooney, Vaughan, Eckert, Laver, & Jack, 1994). . In the software used for the present study, no such corrective feedback is provided within the application itself. However, in the case of isolated phonemic production practices, learners may self-correct themselves by trying to produce sounds that match or closely match the sound pattern graph in the speech analysis section.

Across the globe, the fast-paced technology is expanding and it is deployed to match the needs of specific learners. As with the case of the software used in the present study and others that were developed, used and reviewed, further research and improvement were needed. Some consistent weaknesses and strength that are found in different software can be mapped and perfected. One important element that should be considered in this process is the involvement of human interaction as looked at from communicative competence point of view. The present study however, despite the availability of features that to some extent address this issue, focused only on one part of pronunciation, which is the phonemic correctness in speech production.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter describes the methodology of this study, which will be explained with regards to setting, speech data collection, subjects and sampling procedures, treatment of data and data analysis. The chapter also includes some limitations of the study.

3.1 The Setting

Experiment was conducted in an academic environment, which included students recording and practicing the pronunciations in a Multimedia Language Laboratory. This lab is equipped with computers, and relevant software. The nature of the experiment was determined by the fact that software was used as the main tool in the learning process. Therefore, for the most part, the environment was intentionally self-access learning. However, conventional classroom setting was also integral in the experiment. The presumption is that the availability of the Pronunciation Power software determines the self-access learning environment. However, researchers had to play to some extent, a role, in facilitating and teaching the students regardless of the use of the software as the main tool.

3.2 Data Collection

3.2.1 Primary Data

Primary data was gathered from a survey, which were done on 300 Malay ESL speakers. The researchers recorded 300 participants reading word list which consisted of all the 24 consonant sounds found in words' initial, middle and final positions. 17 vowel sounds were also included amongst the words in the list. The number of vowel was as according to the ones in the pronunciation software used in the research. The participants were not shown the phonetic symbols, they just simply read the words in the list (Refer to Appendix 1) without any

guidance from the researchers.

Recordings were also done on the participants reading sentences, which also consisted of all the consonants and vowel sounds (Refer appendix 1). After the recordings, researchers spent some times on the transcription of all 300 recorded word list and sentence level. Next, researchers classified the sounds which the participants had mispronounced the most. The three consonant sounds - /θ/, /ð/, /ʒ/- were mostly mispronounced in all three positions and some participants cannot produce /eɪ/ and /æ/correctly. Of the number that mispronounced these 3 sounds, 20 participants were selected to be given treatment in the session prepared, using the Pronunciation Power software.

3.2.2 Secondary Data

Primary data was not the sole source of data for this research. The investigation also sought text and online articles in describing findings and discussions. Relevant documents by researchers such as Fraser (2000), Jenkins (2000), Egbert (2004) and Ehsani & Knodt (1998) were also consulted. Theoretical frameworks put forth by them were essential to enrich the present study.

3.3 Subject and Sampling Procedure

Initially, the researchers involved 300 Malay ESL speakers for recordings. Later, once the consonants most mispronounced were identified 20 Malay ESL speakers were selected. They were participants who had had formal English language lesson since standard one. However, none of them had been to any pronunciation class before the experiment. Therefore, the participants had never seen or been given any explanation of the International Phonetic Alphabet (IPA) symbols before they participated in the research.

The selection criteria were generally based on the following three main aspects:

- a. All participants were Malay ESL speakers, which meant, they will use the language as the second language in their study, where most lectures and reference books were in English. Another reason why these subjects were chosen was that the researchers would also like to look at the influence of first language (L1) in their pronunciation of English language sounds.
- b. From the pre-recording session, these students had been identified to have problems producing correctly, the sounds /θ/, /ð/, /ʒ/, /æ/ and /eɪ/, which do not exist in their L1.
- c. Participants chosen were also identified as being computer literate. In other words, they were familiar with the common operations in a computer, such as how to run the software and record their voice using application available in the PC.

3.4 Treatment of Data

A quasi-experimental approach was taken to carry out this study. This is an approach defined by Wiersma (1991) as a “research that involves the use of intact groups of subjects in an experiment, rather than assigning subjects at random to experimental treatments” (p.139). The main reason why intact group was formed for the experiment was the Malay ESL participants involved were students where the researchers used to teach. But, selection bias did not occur since the participants in the intact group formed were random samples of a larger population.

The dependant variable was the result of the treatment, whether the participants, based on the independent variables; the software and the treatment session, can correct phonemic errors identified earlier. Treatment was given to 20 selected participants from the initial 300.

Lesson was given for 30 hours and that included 7 hours for 4 days and additional 2 hours on the fifth day. This was when the software started to play its role. The first day of lesson, researchers explained the purpose of the lessons that will be carried out for the next 30 hours. After that, students were asked to record the list of the IPA symbols in the software based on what they can hear. This was done before any explanation of the IPA was given. The participants recorded all 52 sounds that they produced based on what they heard from the software. After the recording, the researchers explained in brief on the IPA in the software. Then, they were given 5 hours to practice on their own with a 10-minute break in between, with a very minimal help from the researchers.

The first part of the second day, the participants were asked to practice their pronunciation using speech analysis-another feature available in the software. The second half was spent on all the exercises in the software addressing IPA symbols in column 1. Day three spent doing all the exercises for IPA symbols in column 2 and day 4 spent on IPA symbols in the third column. In between the exercises, researchers included practice on tongue twisters focusing on some of the sounds. (Refer to Appendix 4 and Appendix 6)

Diagram 3.1
Phonemic Practices in Pronunciation Power

Column 1		Column 2		Column 3			
Vowel sounds		Consonant sounds		Cluster sounds			
1	iy	beat	19	p	pack		
2	I	bit	20	b	back		
3	ey	bait	21	t	bank		
4	E	bet	22	d	dad		
5	æ	bat	23	k	cap		
6	ə	but	24	g	gag		
7	u ^w	pool	25	m	man		
8	U	book	26	n	new		
9	o ^w	boat	27	ŋ	hang		
10	o	pot	28	f	fat		
11	ay	bite	29	v	vest		
12	oy	boil	30	l	love		
13	a ^w	plow	31	r	run		
14	y	yam	32	w	win		
15	ər	work	33	z	zoo		
16	ɔr	storm	34	s	sat		
17	ar	hard	35	ʒ	plea-ure		
18	ir	fear	36	ʃ	shin		
					37	h	hack
					38	dʒ	jump
					39	tʃ	chum
					40	ð	that
					41	θ	thank
							Cluster sounds
					42	ər	three
					43	kw	quack
					44	sp	spend
					45	sk	sky
					46	st	nest
					47	ld	mold
					48	lt	belt
					49	fs	laughs
					50	ks	masks
					51	ts	lasts
					52	nz	hands

Based on the selection made on the participants, it was undeniable that intervening variable existed where the learning style of the participants affected the ability to comprehend what was learnt and their persistence of going through the session. As such, during the session, data was gathered at several levels, namely isolated phonemic production, prosodic production of speech and in natural speech. Analysis was then carried out to determine the results.

3.5 Analysis of Data

Data analysis was done throughout the session. It required organization of information and data reduction, since pronunciation practice in the software included many other elements besides the one focused in the study. Generally, from the session, quite a large quantity of information was gained and data organization or categorization is important to carry out interpretation and analysis. The data collected was tabulated according to phonemic level, sentence level and natural speech. Phonemic and sentence level, which focused on prosodic features of production were based on the practices available in the software. Natural speech level was carried out by the researchers where participants were individually interviewed before and after the session.

The analysis involved a thorough phonetical transcription of data where pronunciation concerned were analysed according to the three levels mentioned. However, despite the many assertions by researchers in this area, such as Chun (1989) and Fraser (2000), communicative competence, prosodic features of pronunciation were not used as a benchmark for the “correctness” of pronunciation. The focus of the study was limited to only phonemic correctness which may be categorized to solely segmental production.

3.6 Limitations of the Study

The data of the study was gathered in 30 hours in the span of five days continuously. Initially, the purpose of having 30-hour-session was to make it similar to the hours in a 14-week semester where meeting with students is supposed to be 2 hours every week. The duration of session in a day affected the concentration and tolerance of the participants. The shortcoming of this means of collection was that the intervening variable, which is the learning style influenced the reception of the lesson. Therefore, it is not as assertive to generalize the result where time and duration are concerned. However, during the post-session interview, participants were asked of their opinion on the duration and whether it will work out differently if they were given 14 weeks to complete the session. Most agreed that the result will be similar but the session will be less stressful. They would prefer to have the 14-week session rather than 5-day session to complete all the practices done during the treatment.

The logo of UIMP (Universiti Malaysia Perlis) is a large, stylized shield shape. It is divided into four quadrants by a vertical and a horizontal line that meet at the center. The top-left and bottom-right quadrants are light blue, while the top-right and bottom-left quadrants are light purple. The letters 'UIMP' are written in a bold, white, sans-serif font across the center of the shield.

UIMP

CHAPTER 4: FINDINGS & DISCUSSION

4.0 Introduction

This chapter explains the findings of the investigation. The results derived from the information are categorised and reported according to the two research questions and additional section on other findings is also included to report on other consistent deductions.

4.1 Mispronunciations among Malay ESL Speakers.

Research Question One: What are the most common phonemic mispronunciations that occur among Malay speakers of English as a second language (ESL)?

The results were transcribed from 300 recordings on word list and sentence level. The tabulations are in the following tables:

Table 4.1
The Number of Phonemic Mispronunciations Occurring in the Initial Position

Level/phonemic mispronounced	/ð/	/θ/	/ʒ/
Word list	286	282	300
Sentence level	293	287	300

Table 4.1 shows the number of mispronunciations that occurred from 300 participants recorded on two speech levels; word list and sentence level, surveyed on 24 segmental phonemes. The occurrence of the mispronunciations was transcribed from the two levels found in the initial position. An average of 290 participants mispronounced /ð/ at both levels and an average of 284 participants mispronounced /θ/ at both speech levels. All 300 transcriptions showed that the participants cannot pronounce the sound /ʒ/ correctly found in the initial position of the words 'genre'. The difference in number of mispronunciations between word list level and sentence level is not significant and it can be considered that errors occurring at both levels are consistent.

Table 4.2
The Number of Phonemic Mispronunciations Occurring in the Middle Position

Level/phonemic mispronounced	/ð/	/θ/	/ʒ/	/eɪ/	/æ/
Word list	290	284	300	172	272
Sentence level	294	289	300	191	276

Table 4.2 presents the number of mispronunciations that occurred from 300 participants transcribed to identify errors found in 24 segmental phonemes. From the two-speech-level, which are word list and sentence level, the occurrence of the mispronunciations in the middle position was more or less the same in number. Average of 292 occurrences for /ð/ and average of 286 occurrences for /θ/ were found from the transcription. All 300 participants failed to pronounce /ʒ/ correctly in the word 'vision'. While 172 participants mispronounced /eɪ/ at word list level, more number of participants committing errors was found at sentence level, which is 191. Finally, 272 participants mispronounced /æ/ at word list level and 276 at sentence level.

Table 4.3
The Number of Phonemic Mispronunciations Occurring in the Final Position

Level/phonemic mispronounced	/ð/	/θ/	/eɪ/	/t/
Word list	294	287	120	0
Sentence level	296	291	249	2

The number of mispronunciations occurring in the final position is shown in Table 4.3. Out of 300 recordings taken at two speech levels and focused on 24 segmental phonemes, an average of 295 participants mispronounced /ð/ in the word "that". About 289 participants were not able to pronounce /θ/ correctly. Vowel sound error was also found for phoneme /eɪ/; 120 at word list level and 249 at sentence level. The transcription also found two participants mispronounced the consonant phoneme /t/ at sentence level, where the participants replaced the sound in the final position of the word for example 'hat' with glottal stop /ʔ/.

From 300 participants, none was able to pronounce /ʒ/ correctly. In fact, some of them had never heard of such sound before, since the sound was not common even when they were using English. This is an exception with the use of /ʒ/ in the mid position. In this case, all of them substituted the sound with /ʃ/ because the words “vision” and “television” are common and in their L1 it is pronounced as /telɪvɪʃən/. /ʒ/ in the initial position was mostly substituted with either /g/ or /dʒ/ as in /dʒenərəl/.

14 participants managed to pronounce /ð/ correctly at word list level, while only 7 participants managed to pronounce the sound correctly at sentence level in the initial position. The number of participants mispronouncing the phoneme was almost the same for middle and final position as compared to initial position. Participants were more conscious of the isolated phonemes in the word list level compared to sentence level. At the natural speech level, most of the participants were not very conscious of their speech. Out of many occurrences of the sound /ð/, which mostly occurred in the initial position, such as in the word “the”, almost all of them substituted it with the sound /d/. This happened before the treatment as well as after the treatment was given to the 20 selected participants, with exceptions of four who managed to realize the error and self-correct themselves.

In the case of /θ/, for all three positions, the difference in number of participants mispronouncing the phoneme was extremely small and can be considered consistent. 18 participants, at the word list level in the initial position pronounced the phoneme correctly and 13 in the final position. This shows that the position where the sound occurs does not affect the pronunciation. The mispronunciation where it occurred in the mid position, was due to the word they were asked to say. They substituted the sound with /d/, for the word “brothel”. The word looked like ‘brother’ to them with supposedly /ð/ in the mid position.

At sentence level, found in final position, /t/ was mispronounced and substituted with glottal stop /ʔ/. For example in the sentence 'Man must not cry', transcribed as /men mʌs nɔʔ kraɪ/. However, there were only two participants who committed the error and it was not significant to note the phoneme as the common mispronunciation. This isolated case can be considered from different view. Observation and information gathered through interview revealed that this occurrence was due to first language dialectal influence. Both participants came from the east coast of Malaysia and even when they are speaking standard Bahasa Melayu (BM), it is heavily influenced by a thick Kelantanese dialect.

This study basically focuses on consonant mispronunciations. However, from the recordings and transcription it was found out that there are two prominent vowel mispronunciations that occurred consistently. The two vowels were /eɪ/ and /æ/. /eɪ/ was found mispronounced in the middle and final position at both speech levels and /æ/ was found in middle position at both speech levels. The /eɪ/ sound was not very noticeable as error because the participants were not able to pronounce diphthong very clearly. However, the substitution of /eɪ/ with a sound which is not diphthong did not affect intelligibility of the message.

/æ/ was another vowel sound that most participants mispronounced at both levels. About 26 participants managed to pronounce the phoneme accurately. All participants who mispronounced the phoneme substituted /æ/ with /e/ at both speech levels. Nevertheless, the error was not very apparent and did not distort the overall meaning of the sentence or the meaning of the word in which the sound is found.

To refer to Michael Vaughn-Rees (2001) again, where he asserted that "mistakes in vowels are not so problematic," in this case, he bears some truth. The vowel sounds mispronounced did not change the meaning of the words. It is unlike some consonant sounds for

instance /t/ and /θ/, which can be found in words ‘tree’ and ‘three’. If the speaker substitutes /t/ in the word ‘three’ /θri:/, confusion might occur. If this happens, intelligibility in communication is compromised.

Generally, mispronunciations among Malay ESL speakers occurred due to the phonological system in L1 and L2. Both consonant and vowel mispronunciations were L2 phonemes that do not exist in L1 of the speakers. The consonant sounds /θ/, /ð/, /ʒ/ and vowel sounds /eɪ/ and /æ/ are L2 phonemes that are not used in Bahasa Melayu (BM). As many researchers like Goilo (1979), Obediente (1991) and Yoshio Okito (2000) claimed previously, this study agrees to the statement where there is a strong relationship between mispronunciation and L1 influence. The first language of the speakers influences greatly the pronunciation of L2.



UMP

4.2 The Use of Pronunciation Software in Correcting Mispronunciations

Research Question Two: How effective is the software in assisting the correction of the mispronunciations identified?

First, to explicate the roles of the software and how effective it is, it would be most appropriate to explain the physical features and functions of this tool. It has features that address both audio and visual needs of learners in learning pronunciation. There are four main sections in the software that are sequentially arranged from left to right in the order of Lesson, Exercises, Dictionary and Games.

Diagram 4.1
Some Physical Features of Pronunciation Power Software



Contour that displays correct pronunciation. Participants will record the sound and try to get the closest match if not exactly the same.

Based on the session, researchers listed three main areas where the software was most useful in the learning process. First, the learners can measure the degree of accuracy in sound production by using the speech analysis. Learners can repeatedly record and check until they were really satisfied with the production. In the case of this study's focus, all participants managed to get the /θ/, /ð/, /ʒ/, /æ/ and /eɪ/ sounds correct when they were fully conscious of producing the sounds in isolation.

Secondly, the software helped the teachers to leave the arduous task of trying to be all the time accurate in sound production. This directly helped the learners to depend on the software to learn of the production, positions of dental and tongue, inside and out accurately and repeated the practice as much as they liked or needed it. Third, the software provided the learners with exercises where they can practice not just in producing sounds at word and sentence level, but they also get the chance to practice listening. Listening discrimination helped the participants to distinguish minimal pairs used at word level as well as in a context of a sentence. In S.T.A.I.R, which stands for Stress, Timing, Articulation, Intonation and Rhythm, participants got to listen to the five traits in sentences and reproduce, record and self-check, and they can do this as many times as they liked.

Diagram 4.2
Example of Practices in Pronunciation Power Software



Out of 30 hours allocated, about 25 hours were spent solely on using this software. The software provided learners with front and side views as well as speech analysis for thorough explanation on the pronunciation. The analysis enabled the participants to record their voice and see for themselves of the sound they had produced by matching the wave of their voice and the fixed contour that indicated the correct sound.

The participants spent almost half a day to learn the 52 IPA symbols available in the software. But, by the time they went to the exercises and games, there was no application or use of the symbols they learnt earlier. At the end of the session, during the natural speech level interview with the participants, none of them can memorize the symbols. Most of them can recall /θ/, /ð/ and /æ/ since they look similar to symbols in mathematics. Furthermore, since the software used American accent in the practices, participants said that it was fun to imitate the sound. However, all of them admitted that they had difficulty to distinguish sounds and to produce the S.T.A.I.R correctly in sentences due to this accent constraint.

Ben Shneiderman(1998) cited by Jones (2001), claimed that “computers are no more intelligent than a wooden pencil” (Jones, 2001) . Felix (1997) had proven from his study, where he conducted language classes using computer-based materials, that 75.5% of the 37 participants inclined to consider computers more of a tool rather than a stand-alone tutor in the learning process. In short, the software is a tool necessary for assistance in the learning process. However, the effectiveness of its use depended on the focus of correction and learning in general. In the case of this study, by the end of the session, correction was only successful when the participants were using the software especially the speech analysis feature. By the time they were interviewed at the natural speech level, out of 20 participants, 4 was able to self-correct their pronunciation, while 16 still committed the same errors.

4.3 Other Findings

In this section, we describe some other observations that were found based on the analysis of data. Although they were not included in the aims of the study, there was enough consistency in the frequency of occurrences of these patterns, which warrant an explanation for each of them.

4.3.1 Exposure to Native Speaker's Accent

One apparent finding is the exposure to American accent in many elements of pronunciation. By doing the sentence level practices—the S.T.A.I.R—students got to thoroughly explore the essence of producing the speech in the native sound. They had the chance to imitate the accent at their own pace and in their capacity without feeling any insecurity since the software need not them to interact with other learners. This is one of the strength found in the software because all participants involved in the session felt positive about having the opportunity to practice the accent.

However, during the post-session interview, all 20 participants did not want to sound like American, instead they prefer and are comfortable sounding like they are now. They just wanted to sound Malaysian when speaking English and their concern was mainly the grammar and structure of English language used in spoken and written discourse. Pronunciation was not a factor. All of them agreed that as long as the message got through and the response they get is what is intended, communication is successful regardless of how foreign you sound using English. This in fact was supported by researchers in in this area during a symposium in Vienna. As Jenkins (2000) cited it was asserted that the perspective of being able to “approximate” as closely as possible to the native British pronunciation is considered superior should change. Speakers whose L1 are not English can have traces of “local variety” in their speech because language evolution is now moving towards globalization.

4.3.2 Pedagogic Implication

The analysis led the researcher to discover that despite the nature of the software to be self-access learning tool, the roles of facilitator or teachers were not compromised. Technology is the tool to aid and complement learning process. This is taking into consideration a CALL classroom setting. Jones (2001) claims that in a CALL classroom, teacher intervention is entailed to certain degrees. Dependence of learners on teachers is contributed by the factors that there are variety of cultural or psychological reasons occurring at any level of language proficiency.

There are however, means and methods to optimize utilization of technology in language learning. Self-access activity can be one of them but this requires high level of maturity and sense of responsibility in the learners. In order to achieve this, the role of teachers is still huge and indispensable. Jones (2001) further asserts that students are able to learn from computers when there are supervision and instructions from the teachers. Essential teacher-student interaction is the vital contributor for CALL to be effective. Conclusively, computers might not be able to dominate the space and time of teaching and learning process more than the role of teachers. It can be parallel, but as far as pedagogic implication is concerned, human characters should be preserved and technology in education remains as complementary to the whole picture.

CHAPTER 5: CONCLUSION & RECOMMENDATION

5.0 Conclusion

This chapter presents a summary of the research, and based on the discussion in the previous chapters offer conclusions to the issue of pronunciation repair and the use of software in the correction process. Basically, the study looked into the most mispronounced segmental phonemes among Malay ESL speakers. Data from three levels of speech production were gathered and transcribed thoroughly. Results were derived from the transcription and treated accordingly as described in chapter 3. It was concluded that from 300 recordings of the mentioned levels, there are five distinguished mispronunciations occurred constantly which included three consonant and two vowel sounds.

As indicated in the previous chapter, the strategy adopted with its associated invocation was phonemic-focussed. In a larger communicative purpose, where pronunciation is concerned, this exercise might have different implications altogether, since it was highly rooted in a singular focus emphasizing on selected subjects of Malay ESL speakers. Through the findings and analysis done on the information gathered in the survey as well as the treatment session, the study would like to offer the following conclusions on the pronunciations, patterns and findings derived:

5.0.1 Mispronunciations Among Malay ESL Speakers.

First, based on the strategies adopted in the study, through observation, it was evident that most participants were greatly influenced by the first language, that is Malay. This influence includes intonation, stress, rhythm and most important of all the phonemic system. The pronunciations produced were basically structured on what was acceptable and common in their L1.

The non-existence of certain English phonemes in L1, namely /θ/, /ð/, /ʒ/, /æ/ and /eɪ/ led the participants to substitute the sounds to the closest phonemes exist in L1. In short, just like other elements of second language learning, such as grammar, L1 influence is found to be one of the reasons why errors were committed.

5.0.2 The Effectiveness of Pronunciation Power Software

Findings as reported in chapter 4 indicate that the effectiveness of the software was not completely evaluated due to the singular focus of pronunciation in the present study. The functions available in the software could be further utilized for other areas of pronunciation teaching and learning. Focusing on phonemic correctness only did not do justice to the overall usage of the software. Throughout the session, the correction was evident, participants followed very closely the prescribed pronunciation in the software. Without the software, in a natural discourse, some errors were repetitious with some exceptions of attempts to self-correct. Undoubtedly, the effectiveness of the software and assisting tool is very high with all the audio and visual features. But the effectiveness in specific corrections of segmental or suprasegmental production of speech can be further evaluated.

5.1 Suggestions and Recommendations

To come up with suggestions, there is a need to consider the learner's needs. What kind of learners are considered in this case? Do these learners really use the language as a second language or as an international language? By having to use the language for these two different purposes, the needs and the suggestions for enhancement of the software and recommendations for other matters with regards to pronunciation would be different.

5.1.1 Use of Different Accent

First, as mentioned in chapter two, Jenkins (2000) defined English as an International Language differently from English as a second language. She explained that the evolution of English usage has led to a situation where it is no longer the language of certain nationals but it is used more in a lingua-franca scope. English is used by speakers whose native tongues are different but there are necessities to interact and the most feasible is to communicate in a language previously associated with British or American—English. Today, it is spoken world wide and spoken by non-native to another non-native. Therefore, in light of pronunciation, “intelligibility, comprehensibility and interpretability” (Nelson, 1995) are given emphasis. In other words, you don’t have to sound like American or British to communicate, as long as the message gets across as intended, communication is considered successful.

This is one area that enhancement is needed. The software should cater for speakers who would use English as an international language. Emphasis is no longer put on producing /θ/, /ð/, /ʒ/, /æ/ and /eɪ/ sounds as similar as possible to the native speakers. But, the focus is more on pronunciation that can accommodate interaction where communicative efficiency is promoted (Beebe & Giles, 1984). Maybe to some extent, the software can include voices of non-native speakers for example Malay ESL speakers. But, as mentioned earlier, exposure to different accents is important and helpful in enriching the learners knowledge and awareness.

5.1.2 Extensive Use of IPA Symbols

Another suggestion would be the application of IPA symbols in exercises. Learners needed to see the relevance of learning the symbols. Exercises that follow the lesson would be more related if they include and indicate where and how the symbols are used in context. This can also aid the learners to memorize the symbols should they need to use the symbols to iden-

sounds in other applications, for instance in the dictionary . The games in the software focus more on listening rather than the spoken practice. Again it would be more effective if there are games that need the learners to use the symbols.

5.1.3 Speech Analysis

The recent technology fully exploits the ASR in the producing pronunciation software. It would be very helpful to learners to self-check their speech production especially at the sentence level if the software is able to automatically recognize and evaluate the speech and provide them with feedback, for example in the form of speech analysis contour like the one at the phonemic level. This is taking into consideration suprasegmental and prosodic features of speech production.

5.1.4 Pedagogic Implications

In the area of pedagogy, the findings of the present study would be useful for future research in material design and other uses of English among Malay ESL speakers. It may give some insights on elements that are needed in developing a module such as on how to overcome the interference of L1 in the acquisition and learning of L2. Besides ceasing the interruption of L1, more research may also be done on how L1 may facilitate the acquisition and learning of L2. Information may offer some possible means to assist learning and the extent to which L1 can facilitate the learning of L2 in general.

REFERENCES

- Bernstein, J., & Horacio, F. (1996). Speech recognition by computer. In N. Lass (Ed.), *Principles of experimental phonetics* (pp. 408-434). St. Louis: Mosby.
- Boku, M. (1998, October). Student-centered pronunciation practice: More than "right" or "light." *The Language Teacher Online*, 22(10). Retrieved November 25, 2003, from http://langua.hyper.chubu.ac.jp/jalt/pub/tlt/98/oct/sh_boku.html
- Campbell, D. T. & Stanley, J.C. (1963). Experimental and quasi-experimental designs for research in teaching. In N.L. Gage (Ed.). *Handbook of Research on Teaching*. (pp.171-246). Chicago: Rand McNally.
- Celce-Murcia, M., Brinton, D., & Goodwin, J. (1996). *Teaching pronunciation: A reference for teachers of English to speakers of other languages*. Cambridge, England: Cambridge University Press.
- Chun, D. (1998, July). Signal analysis software for teaching discourse intonation. *Language Learning and Technology*, 2(1), 61-77. Retrieved November 25, 2003, from <http://llt.msu.edu/vol2num1/article4/>
- Dabria, L. (2003). *Sounds Clear: Accent Modification*. Retrieved December 13 2005 from <http://www.soundsclearspeech.com/>
- Darhower, M. (2002, April). CALICO software review: *Connected Speech*. *The CALICO Review*. Retrieved November 25, 2003, from http://calico.org/CALICO_Review/review/conspeech00.htm
- Ding, Huong-doh. (1991). *A Contrastive Phonological Analysis of Malay and English*. Kuala Lumpur: Universiti Malaya.
- Donahue, S. (1999). *Teaching pronunciation on line*. Retrieved November 25, 2003, from <http://www.broward.edu/~sdonahue/teaching-online.html>
- Egbert, J. (2004). Review of Connected Speech : overview of pronunciation in language learning. *Language Learning & Technology*. 8(1), 24-28.
- Ehsani, F. & E. Knodt (1998). Speech technology in computer-aided language learning: strengths and limitations of a new CALL paradigm. *Language Learning & Technology*. 2(1), 45-60.
- Fatimah Adelina Sastrawidjaja. (1990). *Mother Tongue Interference in Native BM Speakers of English*. Dissertation (M.M.L.S.). Pusat Bahasa, Universiti Malaya.
- Felix, U. (1997). Integrating multimedia into the curriculum: a case study. *ON-CALL*, 11/1, 2-11.

- Florez, M. (1999, June). *Improving adult English language learners' speaking skills*. National Center for ESL Literacy Education (Report No. EDO-LE-99-01). Available online at ERIC Digest <http://www.cal.org/ncle/digests/Speak.htm>
- Fraser, H. (1999). ESL pronunciation teaching: Could it be more effective? *Australian Language Matters*, 7(4), 7-8.
- Fraser, H. (2000). *Coordinating improvements in pronunciation teaching for adult learners of English as a second language*. Canberra: DETYA (ANTA Innovative Project).
- Goilo de T, I. (1979). A contrastive analysis of the consonantal systems of RP English and Venezuelan Spanish. (Trabajo de ascenso), Mérida, Venezuela: University of Los Andes.
- Hiller, S., Rooney, E., Vaughan, R., Eckert, M., Laver, J., & Jack, M. (1994). An automated system for computer-aided pronunciation learning. *Computer Assisted Language Learning*, 7(1), 51-63
- Jenkins, J. (2000). *The Phonology of English as an International Language*. New York: Oxford Press.
- Jones, J. (1995). Self-access and culture: retreating from autonomy. *ELT Journal*, 49/3, 228-234.
- Jones, B. (2000) "Speech Technologies for Language Learning", *Language Learning and Technology* 3, 2: 6-9.
- Jones, R. (2001) "You're Not From 'Round Here, Are You? Naive Bayes Detection of Non-native Utterance Text", in *Proceedings of NAACL*. Pittsburgh, 2001
- Levinson, S., & Liberman, M. (1981). Speech recognition by computer. *Scientific American*, April, 64-76.
- Levis, J. (1999). Intonation in theory and practice, revisited. *TESOL Quarterly*, 33(1), 37-63.
- Mora, E. (1987). Las obstruyentes implorativas en el español hablado en Mérida: Un proceso de variabilidad. Tesis de Maestría no publicada. Universidad de Los Andes.
- Morley, J. (1991). The pronunciation component in teaching English to speakers of other languages. *TESOL Quarterly*, 25(1), 51-74.
- Munro, M., & Derwing, T. (1995). Foreign accent, comprehensibility, and intelligibility in the speech of second language learners. *Language Learning*, 45 (1), 73-97.
- Obediente, E. (1991). Fonética y fonología (2nd ed.). Mérida, Venezuela: Consejo de Publicaciones, Universidad de los Andes.

- Okita, Y. (1999). Teaching pronunciation. *English Teaching Forum*, 36(3), 16-21. Retrieved December 23, 2005, from <http://dosfan.lib.uic.edu/usia/E-USIA/forum/vols/vol37/no1/p16.htm>
- Otlowski, M. (1998, January). Pronunciation: What are the expectations? *The Internet TESL Journal*, 4(1). Retrieved November 25, 2003, from <http://iteslj.org/Articles/Otlowski-Pronunciation.html>
- Robertson, P. 2002 (accessed September 2005) Teaching English pronunciation Skills to the ASIAN learner. A cultural complexity or subsumed piece of cake? *The Asian EFL Journal* <http://www.asian-efl-journal.com/decart2002.htm>
- Robertson, P. 2002a, (accessed September 2005), 'Asian EFL Research Protocols', *The Asian EFL Journal*, (Online), <http://www.asian-efl-journal.com/decart2002a.htm>
- Rodriguez M. V. (2000). Implementation of an Accent Reduction Program to Decrease Mispronunciations in the Interlanguage Spoken by a Venezuelan EFL Speaker. Los Andes: School of Modern Languages, Venezuela.
- Salaberry, M. R. (1996). A theoretical foundation for the development of pedagogical tasks in computer mediated communication. *CALICO Journal*, 14(1), 5-34.
- Shneiderman, B. (1998). *Designing the User Interface: Strategies for Effective Human-Computer Action*. Ontario: Addison Wesley.
- Vaughn-Rees, M. (2000) The past, present and future of English rhythm. Changes in pronunciation. *IATEFL*, 8-13.
- Vaughn-Rees, M. (1997) Pickled peppers and pronunciation. *English Teaching Professional*. 5, 41-47.
- Vitanova, G., & Miller, A. (2002, January). Reflective practice in pronunciation learning. *The Internet TESL Journal*, 8(1). Retrieved November 25, 2003, from <http://iteslj.org/Articles/Vitanova-Pronunciation.html>
- Wennerstrom, A. (1999, October/November). Why suprasegmentals? *TESOL Matters*, 9(5). Retrieved November 25, 2003, from <http://www.tesol.org/isaffil/intsec/columns/199910-sp.html>
- Wiersma, W. (1991). *Research Methods in Education: An Introduction*. Toledo: Allyn & Bacon.

APPENDIX 1

Instructions:

1. The list is divided into 2 parts: a) Word list, b) Sentences
2. Read the following list slowly in the direction indicated (\longrightarrow)
3. Pay attention to your lecturer's instruction/ guidance.
4. Before reading the list please state clearly your:

Name:

Matric No:

(A) WORD LIST (\longrightarrow)

NO	1	2	3
1	pen	upper	lap
2	ban	label	lab
3	tag	utter	but
4	dig	header	lad
5	key	locker	lack
6	goat	digger	bag
7	food	offer	leaf
8	vote	over	leave
9	think	brothel	both
10	that	bother	smooth
11	say	hassle	base
12	zip	buzzer	buzz
13	show	pusher	bash
14	genre	vision	-
15	hat	inhale	-
16	chat	butcher	pitch
17	jump	ledger	urge
18	man	limo	slam
19	no	dinner	plan
20	-	singer	ring
21	way	-	-
22	lad	filler	bill
23	rot	hurry	
24	yes	-	-

Pause

You are now in section (b). Read the sentences slowly.

(B) SENTENCES

1. The pen and the book are on the table
2. There is no way out definitely.
3. Take the keys and give them to me.
4. Voice out what you feel and think.
5. See what happens if you don't zip the bag.
6. Shakespeare wrote great masterpiece of various genres.
7. Hens and chickens are jumping happily.
8. Man must not cry.
9. The rope is way too long.
10. You must throw the rotten eggs.
11. The super heroes are labeled as rotten bidders.
12. Lucky winners will help the beggars.
13. The offer at the mall is over.
14. Mother puts the mothball beside the hazard light.
15. He has passion for colorful vision.
16. The butcher removes the manhole with a dredger.
17. The lab is not far.
18. Tap the load with a tag.
19. Leave both the loaf and the clothe
20. The race in the maze and the bush must merge the two teams.
21. The lamb and the clan sing at the mall.

APPENDIX 2

SAMPLE TRANSCRIPTION OF WORD LIST & SENTENCE LEVEL

Instructions:

1. The list is divided into 2 parts: a) Word list, b) Sentences
2. Read the following list slowly in the direction indicated (\longrightarrow)
3. Pay attention to your lecturer's instruction/ guidance.
4. Before reading the list please state clearly your:
 - a. Name:
 - Matric No:

(A) WORD LIST (\longrightarrow)

NO	1	Transcribed	2	Transcribed	3	Transcribed
1	pen	/pen/	upper	/ʌpə/	lap	/lep/
2	ban	/ben/	label	/lebəl/	lab	/leb/
3	tag	/teg/	utter	/ʌtə/	but	/bʌt/
4	dig	/dɪg/	header	/hedə/	lad	/led/
5	key	/ki:/	locker	/lɒkə/	lack	/lek/
6	goat	/geut/	digger	/dɪgə/	bag	/beg/
7	food	/fud/	offer	/ɒfə/	leaf	/lif/
8	vote	/vot/	over	/ovə/	leave	/liv/
9	think	/tɪnk/	brothel	/brɒdəl/	both	/bof/
10	that	/det/	bother	/bɒdə/	smooth	/smuz/
11	say	/seɪ/	hassle	/hesəl/	base	/beɪs/
12	zip	/zɪp/	buzzer	/bʌzə/	buzz	/bʌz/
13	show	/ʃəʊ/	pusher	/pʊʃə/	bash	/beʃ/
14	genre	/dʒenrə/	vision	/vɪʃən/	-	
15	hat	/het/	inhale	/ɪnhel/	-	
16	chat	/tʃet/	butcher	/bʊtʃə/	pitch	/pɪtʃ/
17	jump	/dʒʌm/	ledger	/ledʒə/	urge	/ədʒ/
18	man	/men/	limo	/lɪmo/	slam	/slem/
19	no	/no/	dinner	/dɪnə/	plan	/plen/
20	-		singer	/sɪŋə/	ring	/rɪŋ/
21	way	/weɪ/	-		-	
22	lad	/led/	filler	/fɪlə/	bill	/bɪl/
23	rot	/rɒt/	hurry	/hʌrɪ/		
24	yes	/jes/	-		-	

Pause

You are now in section (b). Read the sentences slowly.

(B) SENTENCES

1. The pen and the book are on the table.
/də pen ɪz ɒn də teɪbl/
2. There is no way out definitely.
/ðe ɪz no weɪ aʊt defənətli/
3. Take the keys and give them to me.
/teɪk də ki ɪn gɪv ðəm tu mi/
4. Voice out what you feel and think.
/voɪs aʊt wʌt ju fi:l ɪn θɪŋk/
5. See what happens if you don't zip the bag.
/si wʌt hɛpən ɪf ju dɒn zɪp ðə bæʒ/
6. Shakespeare wrote great masterpiece of various genres.
/ʃeɪkspɪə rəʊt greɪt mɑ:stəpi:s ɒf vərɪəs dʒenrə/
7. Hens and chickens are jumping happily.
/hens ɪn tʃɪkən ʌ dʒʌmpɪŋ hɛplɪ/
8. Man must not cry.
/mæn mʌs nɒt kraɪ.
9. The rope is way too long.
/ðə rəʊp ɪz weɪ tu lɒŋ/
10. You must throw the rotten eggs.
/ju mʌs θrəʊ ðə rɒtən eɪʒs/
11. The super heroes are labeled as rotten bidders.
/ðə sʊpə hɪrəʊs ʌ leɪbəd əz rɒtən bɪdəs/

12. Lucky winners will help the beggars.

/lʌki wi:nəs wəl help də begəz/

13. The offer at the mall is over.

/də ɒfə et də mɒl ɪs ɒvə/

14. Mother puts the mothball beside the hazard light.

/mʌðə put də mɒsbɔ:l bɪsaɪd də heɪzəd laɪt/

15. He has passion for colorful vision.

/hi hæz peɪʃən fɔ kʌləfʊl vɪʃən/

16. The butcher removes the manhole with a dredger.

/də bʊtʃə rɪmu:v də mənhaʊl wɪθ ə dregə/

17. The lab is not far.

/də leɪb ɪz nɒt fɑ:/

18. Tap the load with a tag.

/tæp də ləʊd wɪθ ə tæg/

19. Leave both the loaf and the clothe

/li:v bəʊθ də ləʊf en də kləʊθ/

20. The race in the maze and the bush must merge the two teams.

/də reɪs ɪn də meɪz en də bʊʃ mʌs meɪdʒ də tu: ti:mz/

21. The lamb and the clan sing at the mall.

/də lem en də klen sɪŋ et də mɒl/

APPENDIX 3

NATURAL SPEECH 1

- Q1. Tell me a little bit about yourself.
- Q2. Can you tell me a little bit about you family?
- Q3. What about your education?
- Q4. What do you like about your course?
- Q5. What do you expect to learn from this session?

NATURAL SPEECH 2

- Q1. How do you feel after you have gone through the session?
- Q2. Do you feel any of the slots improve your pronunciation in general? Which one?
- Q3. Can you memorize the symbols?
- Q4. Which of the sounds that you managed to improve or correct?
- Q5. Which of the slots from the session do you like the most? Why?
- Q6. Which of the slots from the session you don't like? Why?
- Q7. Do you think enough time was allocated for the session?
- Q8. Would you encourage your friends to use the software? Why?

APPENDIX 4

SESSION SCHEDULE

DAY/DATE	SLOT	
	1 (09:00-13:00)	2 (14:00-17:00)
MON 21-03-2005	<ol style="list-style-type: none"> 1. Introduction to the research 2. Instructions 3. Pronunciation of vowel & consonant sounds in isolation 4. Natural speech recording 1 	<ol style="list-style-type: none"> 1. Using the Pronunciation Power Software (Phonemes—IPA)
TUE 22-03-2005	<ol style="list-style-type: none"> 1. IPA checklist 2. Using the Pronunciation Power Software (Phonemes—IPA) 	<ol style="list-style-type: none"> 1. IPA checklist 2. Using the Pronunciation Power Software (Phonemes—IPA) 3. Using Speech Analysis feature
WED 23-03-2005	<ol style="list-style-type: none"> 1. IPA checklist 2. Sample words 3. Comparative words 4. Listening Discrimination 5. S.T.A.I.R 	<ol style="list-style-type: none"> 1. Practice on IPA 1-30: <ul style="list-style-type: none"> ◆ Level 1 Sentence ◆ Level 2 Sentence ◆ Recorded test (Passage reading)
THUR 24-03-2005	<ol style="list-style-type: none"> 1. Practice on IPA 31-52: <ul style="list-style-type: none"> ◆ Level 1 Sentence ◆ Level 2 Sentence ◆ Recorded test (Passage reading) 	<ol style="list-style-type: none"> 1. Post-test: <ul style="list-style-type: none"> ◆ IPA checklist ◆ Word list level ◆ Sentence level
FRI 25-03-2005	<ol style="list-style-type: none"> 1. Natural Speech Recording 2 	

APPENDIX 5

IPA CHECKLIST

NO 1 OF 8

Instructions:

- 1) Write "C" for *correct* or "W" for *wrong* accordingly
- 2) "C" means **correct or close** to the sound heard in the software. Pay attention to the **lips** position/ movement.

Name: _____

NO	SYMBOL	C/W	NO	SYMBOL	C/W	NO	SYMBOL	C/W
1	i:		19	p		37	h	
2	ɪ		20	b		38	dʒ	
3	eɪ		21	t		39	tʃ	
4	e		22	d		40	ð	
5	æ		23	k		41	θ	
6	ə		24	g		Consonant clusters		
7	u:		25	m		42	θr	
8	ʊ		26	n		43	kw	
9	əʊ		27	ŋ		44	sp	
10	ɒ		28	f		45	sk	
11	aɪ		29	v		46	st	
12	ɔɪ		30	l		47	ld	
13	aʊ		31	r		48	lt	
14	j		32	w		49	fs	
15	ər		33	z		50	ks	
16	ɔ:		34	s		51	ts	
17	ɑ:		35	ʒ		52	nz	
18	ɪə		36	ʃ				

APPENDIX 6

Tongue Twisters 1 & 2

/r/, /l/	Red lorry, yellow lorry, red lorry, yellow lorry.
/θr/	Three free throws.
/ð/, /e/	Lesser leather never weathered wetter weather better.
/ɔɪ/	A noisy noise annoys an oyster.
/e/, /ɛ:/	I cannot bear to see a bear Bear down upon a hare. When bare of hair he strips the hare, Right there I cry, "Forbear!"
/r/	Ruby Rugby's brother bought and brought her back some rubber baby-buggy bumpers.
/eɪ/	My dame hath a lame tame crane, My dame hath a crane that is lame.
/w/	Which witch wished which wicked wish?
/j/, /u:/	If Stu chews shoes, should Stu choose the shoes he chews?
/θ/	I thought a thought. But the thought I thought wasn't the thought I thought I thought.
/s/, /f/	One smart fellow, he felt smart. Two smart fellows, they felt smart. Three smart fellows, they all felt smart
/s/, /k/	The sixth sick sheik's sixth sheep's sick.
/t/	The two-twenty-two train tore through the tunnel.
/s/, /θ/	Six thick thistle sticks. Six thick thistles stick
/b/	A big black bug bit a big black bear, made the big black bear bleed blood
/s/, /ʃ/	She sells sea shells by the sea shore. The shells she sells are surely seashells. So if she sells shells on the seashore, I'm sure she sells seashore shells.
/w/	How much wood would a woodchuck chuck if a woodchuck could chuck wood? He would chuck, he would, as much as he could, and chuck as much wood as a woodchuck would if a woodchuck could chuck wood.
/w/, /ʃ/	What time does the wristwatch strap shop shut?
/θ/	Theophilus Thistle, the successful thistle sifter, successfully sifted some thistles.
/r/	Round and round the rugged rocks the ragged rascal ran.

APPENDIX 7

PASSAGE 1 (with pause markers)

In the summer / the weather / was often / very hot, / so a young man / decided to sleep / in a hammock / in the garden / of his house. / He knew / that the garden / was much cooler / than his room./

He had / a lot of trouble / putting up / the hammock / but at last / he succeeded. / He was / so tired / that / he went to sleep / at once./

While / he was sleeping, / two squirrels came / and / started biting / the ropes / of the hammock. / It was not long / before the ropes gave way / and the hammock / fell to the ground./

The young man / wasn't hurt, / but he was angry / with the squirrels. / He shouted / at them, / but they just / sat on the branch / looking at him./ He was sure / that they squirrels / were laughing / a him / for being so lazy./

PASSAGE 2 (with pause markers)

On Monday, / I went / to see a film / at the cinema. / I had waited / a long time / to see it / and I was very excited./

When I arrived / at the cinema, / I bought my ticket / and went in./ There were no lights / in the cinema, / but I found / a good seat / and sat down./

While / I was waiting / for the film / to start, / I heard / a strange noise. / I wondered what it was, / so I looked / under the seats. / I couldn't see / anything, / so I asked / the girl / sitting next to me / if she had heard / anything. / She said / she hadn't.

Later, / the film / became very exciting. / Suddenly, / the girl / next to me / screamed and jumped / out of her seat.

When I asked her / what had happened / she said / she felt / something touching her foot. / When she looked / to see what it was, / she saw / a big rat / biting her toe!/
UIMP