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Creating Awareness of Incorrect English Pronunciation in Thai Elementary School by using the Detect Me English Application

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Abstract

This research examines the ability of the Detect Me English application to create awareness of incorrect pronunciations in Thai Elementary Students (identified through Natural Language Processing). The English correction software developed for this research uses an android system combined with the Detect Me English application to analyze the phonological sounds produced by the students. The researchers tested 60 students in total from grades 4-6. The main objective of this research was to test the Detect Me English application's effectiveness in creating awareness of correct English phonetic pronunciations. Further objectives were to measure the improvement of the students after being first exposed to the application and being instructed on the correct pronunciation so as to evaluate the efficiency of the application becoming a teaching tool in Thai classrooms. The instruments used were the Detect Me English application as well as the 30 words taken from the English Standard Curriculum and inputted into the application; 10 grade 4 level words, 10 grade 5 level words and 10 grade 6 level words. The results showed that the sample groups were not aware of many of the English phonological rules. Upon further analysis of the data recorded the post-test revealed that students were able to obtain significantly higher results.

Keywords: English Pronunciation; English Pronunciation Awareness; English Correction Natural Language Processing Software; Phonetics Learning

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Introduction

Upon seeing Stephen Hawking's speech synthesizer in action many of us were amazed with the machine's ability to convert text to speech. The 'EZ keys' program used could automatically scan each word row and column then produce the respective sounds. The incredible step forward in the field of NLP meant a computer had the ability to process language to the point of giving a voice to a once voiceless man. NLP is broken up into many different fields. This research focuses particularly on computational phonetics and phonology of which there are two categories. Hawking's machine is an example of speech synthesis, the process of creating electronic signals which can then initiate the output of audio through an electronic speaker (Fromkin et al., 2011 : 392) . This output will vary according to the phones and prosodic features present in the original text. The other category is speech recognition, where a computer must analyze the phones created and transcribe them into a phonetic transcription in order to generate ordinary text which can then be displayed on the screen. The practical implementation of NLP brought about the 'Detect Me English' application. The application has the ability to transform a regular android device into a device which can both synthesize and recognize speech output.

Thai curriculum requires that English be taught from kindergarten level all the way through to the final year of high school as a fundamental subject. Even so, many students are unable to speak or use English to convey ideas effectively. Ellis (1997) says that the key to good speaking begins with good pronunciation. Multiple studies have revealed that the majority of Thai student's pronunciation errors originate from the fact that they often attempt to pronounce English sounds as by using the familiar Thai consonants (Lakhawatana, 1969; Chanyasupab, 1982; Malarak, 1998; Mano-im, 1999). The problem is that the phones and phonemes present in Thai language are different from that of English which means that Thai students are prone to mistakes, especially in their pronunciation. The foundations of the Contrastive Analysis Hypothesis show that the elements which are analogous to the learner's native language will be simple for him, and those elements that are dissimilar will be more challenging (Lado, 1957).

This study aims to address how NLP could improve language learning in the remote area of Khoa Kho, Phetchabun. The study highlights how the researcher

introduced the application to the school in order for it to be used as a tool to improve English language learning in the area of correct pronunciation of English words. The study follows qualitative approach and focuses on primary school students from grades 4 to 6, ages 10-13 years old from Nong Mae Na school. Recognizing the difficulty Thai teachers have in teaching phonetics and the lack of native language speakers in many of Thailand's schools, the Detect Me English application was developed. This research was then run to see its effectiveness in facilitating Thai elementary student's English pronunciation acquisition and to measure the effectiveness of NLP in creating awareness of correct English pronunciation.

Literature Review

Language Transfer

Learning to pronounce English correctly is difficult for ESL students. One of the factors that cause difficulties is the difference between the phonology of their native language (L1) and that of the second language (L2). L2 learners will rely on the knowledge of their first language and their prior experience to deal with L2 problems. So, L1 transfer becomes inevitable in L2 learning. Brown (2000) proposes six factors that may hinder or facilitate learner's pronunciation of L2 are; language transfer, age, exposure to L2, innate phonetic ability, identity and language ego for L1, motivation, and finally the concern for good pronunciation ability. Second language learners may stop short of L2 competence due to fossilization which is the relatively permanent incorporation of incorrect linguistic forms of which are often transferred from L1 (Selinker, 1972 : 209-241).

A Contransitive Analysis

In total there are 21 Thai consonant phonemes whereas the number of English phonemes is generally listed as 24. Both languages have phonemes which are not found in the other language or can be found but are used in certain environments which differ from language to language. The English sounds which are not in Thai phonology include /g/, /v/, /z/, /ð/, /ʒ/, /θ/, /ʃ/, /tʃ/ and /dʒ/.

The voiced velar plosive /g/ sound is often pronounced /k/ which is a voiceless velar plosive sound (Bowman, 2000 : 40-53). The places of articulation are still the same however the sound changes from voiced to voiceless simply because

the /g/ sound does not exist in Thai phonology. English voiced fricatives like /v/, /z/, /ð/ and /ʒ/ are often replaced with other consonant sounds that the speaker thinks best resembles the target sound.

Examples

/v/ becomes /w/

/ð/ becomes /d/

/z/ becomes /s/

/ʒ/ becomes /t/

In linguistics when talking about different environments it is referring to aspects like syllable position. For example all English voiceless fricatives positioned as final sounds are very hard for Thai L2 learners to master; /f/, /s/, /θ/ and /ʃ/. This is due to the fact that of the final plosive and nasal sounds in Thai language there are only four plosive sounds (/p/, /t/, /k/ and /ʔ/) and three nasal sounds (/m/, /n/ and /ŋ/) which are as final sounds, all of which are pronounced inaudibly (Abramson, 1972 ; Tuapharoen, 1990). Thai L2 learners will either replace these voiceless fricatives with a familiar Thai final sound or omit them entirely (Sahatsathatsana, 2017)

With further contrastive analysis many more differences can be found as well as curious occurrences where both languages actually have the sounds needed for correct pronunciation yet for Thai L2 learners they have difficulty pronouncing words with /l/ and /r/ sounds. Ellis (1997) suggests that this is most likely due to behaviorism in that Thai's use the two sounds interchangeably when speaking Thai which causes the habit to be transferred when they attempt to pronounce English words.

B Awareness of Correct English Pronunciation

Motivation in learning is the strongest factor which contributes to student's success in second language acquisition (Dornyei, 2001). There are many things that can cause demotivation for example when an L2 learner attempts to talk to a native speaker only to find out that they don't understand them or when a student finds out they have been pronouncing a word incorrectly all along. This might seem like something that is inevitably going to happen when learning a second language however; there are ways to prevent mispronunciation. That is why it is so important to generate an awareness of phonological rules and correct pronunciation early on in language instruction. If teachers wait too long until the point that fossilization occurs, even with considerable input and instruction, L2

learners will not be able to acquire the challenging sounds which do not exist in Thai phonology.

Methodology

Objectives

Given the difficulty Thai L2 learners have in creating English sounds correctly the main objective of this research was to test the Detect Me English application's effectiveness in creating awareness of correct English phonetic pronunciations. Further objectives were to measure the improvement of the students after being first exposed to the application and being instructed on the correct pronunciation so as to evaluate the efficiency of the application becoming a teaching tool in Thai classrooms.

Sample Group and Instruments

The sample group used for this study comprised of elementary students from Nong Mae Na School (N=60). There were 20 students taken from grades 4, 5 and 6 accordingly. The school selected for the trail was a rural school with no native language teachers so all English instruction was conducted by Thai teachers. The instruments used were the Detect Me English application as well as the 30 words taken from the English Standard Curriculum and inputted into the application; 10 grade 4 level words, 10 grade 5 level words and 10 grade 6 level words.

Application Design

The Detect Me English application is compatible with android systems as seen in figure 1.

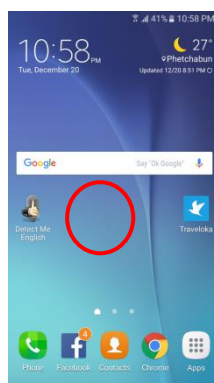


Fig. 1. Application will show up on the main screen, click to open up the main page.

From the homepage (Figure 2) there are two menus to choose from. The START menu links the user to the 30 key words selected for this research.



Fig.2 Home page of the Detect Me English application.

Once the program is running the user will see the main screen hub (figure 3). The hub which has functions and displays as follows

1. Microphone Button; this button is pressed when the user is ready to attempt to pronounce the subject word.
2. The Subject Word: where the English word the user needs to pronounce is displayed.
3. Results Box: where the subject word will display upon the user making the correct pronunciation of the word in English. If there is incorrect pronunciation then the display will not show anything.
4. Incorrect Pronunciation Results Box: When the user making an incorrect pronunciation, the application will process the users attempt and display phonetically what the user has pronounced, thus allowing the user to distinguish what kind of phonetics they are incorrectly pronouncing.
5. The Demo Button: before the user tests themselves they can listen to the correct pronunciation by selecting the demo button.
6. Back Button: The user can skip back to the previous word.
7. Next Button. The user can skip to the next word (figure 3.)

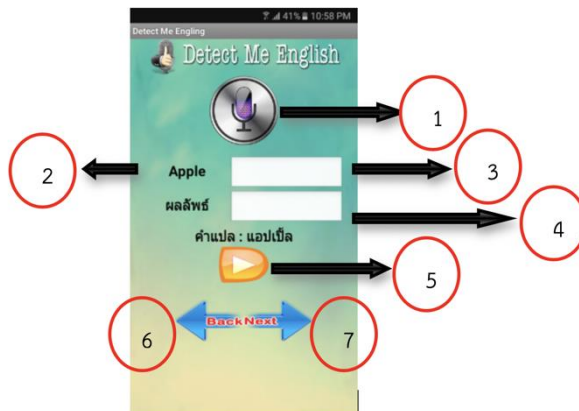


Fig.3. Main on-screen hub for the Detect Me English application

The 30 key words that the sample group worked through for this trail were taken from three different levels; grade 4, 5 and 6 level. Each of these words were chosen based upon the suitability to address the L1 to L2 phonetical barrier as well as their suitability for primary school ages. Each word written into the program can be easily changed as the number of words is not limited and new words can be added or taken away from the library catalogue at any time. The strength of this program is the straight forwardness for teachers to be able to add or change words as desired (see figure 4). The program is also connected with an external hardware which collects the results of the user.

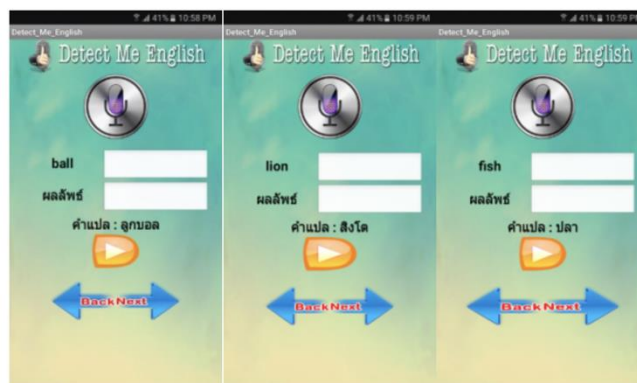


Fig.4. Examples of other word options

Software Protocol Processing

The recognition software functions by first receiving the input sound through the device's microphone. The information is then processed into its component phones and phonemes and converted into ordinary text which is then displayed in either one of the results boxes depending, of course, on the user pronunciation. The application uses the process of speech synthesis as well as speech recognition in that any words that are inputted into the program can generate for the user to attempt to emulate and any words in the system can also be tested for correct pronunciation by simply having the user speak into the android device's microphone.

Data Collection

Quantitative data were collected for this study. For both the pre-test and post-test each student was given 3 opportunities to pronounce the 30 selected key words. After the pre-test on the first day, the sample group was given instruction from Thai University students who had been exposed to and using the application already. Educational activities and games both using the Detect Me English application and not using it were devised by the students with the aim to generate a greater awareness of the correct pronunciations. At the end of the second day the sample group was tested again using the same method to see if there was any improvement. The data from both pre-test and post-test were then collected and analyzed by the researchers.

Results

The results showed that the sample group was not aware of many of the English phonological rules. In the pre-test a majority of the words were mispronounced and while in the post-test the sample group's pronunciation improved significantly, the level of correct pronunciations was still low with the overall percentage of correct pronunciations less than 50% for all grades (figure 5).

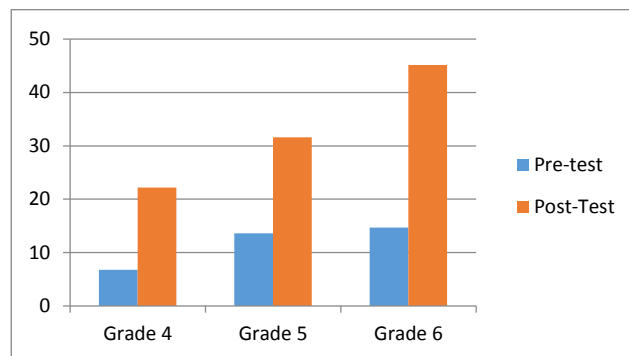


Fig. 5 Graph showing the overall percentage of correct pronunciations according to the Grade levels.

Limitations

The limitations of the Detect Me English application, as with most speech synthesizing devices, the sounds generated have a very machine-like quality or accent. So, while the students are able to correct their pronunciation with the device suprasegmental factors, like intonation and stress patterns, can't be addressed. Another limitation came from the researches design in that while the application shows which phonemes the user is failing to create accurately the data recorded by the application simply showed which words were pronounced correctly or incorrectly. This meant that analysis of which phonological rules and pronunciations were difficult or unknown to the sample group was impossible.

Discussion and Conclusion

This research investigated the effectiveness of the Detect Me English application in facilitating Thai elementary student's English pronunciation. According to Brown (2000) Teachers are always looking for new ways to motivate students to learn which is a part of the six factors that facilitate learner's pronunciation of L2. The results from this investigation show that the application was an effective way not only to test student's pronunciation but encourage and motivate students to achieve higher academic results. Moreover, the practicality of the device in that it can be used by anyone, teachers or students shows its effectiveness in equipping teachers to be able to create awareness of incorrect pronunciations as well as enable students to self-correct.

The second aim of this research was to measure the improvement of the students after being first exposed to the application so as to evaluate the efficiency of the application becoming a teaching tool in Thai classrooms. Second language learners may stop short of L2 competence due to fossilization which is the relatively permanent incorporation of incorrect linguistic forms of which are often transferred from L1 (Selinker, 1972 : 209-241). The pre-test results showed that the sample group initially was unaware of many of the phonological rules in English. The post-test results however showed that after just two days of the students being exposed to the application each grade showed immense improvement. It is unrealistic to expect every Thai teacher to acquire native like English pronunciation however, this research reveals the need to provide tools for teachers to generate an awareness of the correct pronunciations with the added benefit of not having to spend millions of dollars on training. NLP applications can empower Thai teachers to teach correct English pronunciations confidently. As revealed from the post-test results the Detect Me English application, as with many other NLP systems, is an effective way to aid English education. While the results of the sample groups were still low it was apparent that over the course of two days using the Detect Me English application improved the sample group's percentage of correct pronunciations. It is worth considering how much greater the improvement could be if NLP applications like Detect Me English are used continually throughout the course of a child's education.

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