EFFECTS OF A PRONUNCIATION LEARNING MANAGEMENT SYSTEM AMONG STUDENTS OF DIFFERENT LANGUAGE ANXIETY LEVELS

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Abstract

The purpose of this study was to investigate the effects of three presentation modes of 'epronounce' in learning correct pronunciation with phonetic symbols among non-native English speakers with different language anxiety levels. The 'epronounce' which is an interactive multimedia pronunciation learning management system, was designed and developed with three presentation modes (Text + Sound + Phonetic Symbols[TSP], Text + Sound + Phonetic Symbols + Mouth Movements[TSPM], Text + Sound + Phonetic Symbols + Face Gestures[TSPF]) to address the needs of non-native English speakers with low, medium and high language anxiety in improving their pronunciation. The nature of pronunciation learning is a source of language anxiety. Non-native English speakers in particular, are very self-conscious when interacting with others in second/foreign language that might expose their inadequacies. The presentation modes acted as independent variable, while the dependent variable was the mean score of posttest. The moderator variable was the different language anxiety levels. The sample of the study was 329 Primary Five Malaysian students from three different schools. Descriptive statistics and inferential statistics were carried out to analyse the research data. Analyses of Covariance (ANCOVA) were used to study the main effects and the interaction effect of independent variables against the dependent variables. The findings of this study showed that there are no significant interaction effects between language anxiety levels and presentation modes of

'epronounce'. Seemingly 'epronounce' is able to bring the students to medium language anxiety level and hence optimizing pronunciation learning, which is in line with the curvilinear relationship between anxiety and performance.

Keywords: Pronunciation, epronounce, language anxiety, phonetic symbols, curvilinear.

Introduction

Non-native English speakers with influence of the cultural backgrounds and phonological processes of their mother tongue commonly experience difficulties in pronouncing English words correctly, and fundamentally in segmental aspects with the focus on consonants, vowels and diphthongs (Por & Fong, 2011). For instance, Chinese speaking people encounter problem in pronouncing /r/. They may instead produce the sound as /l/, thus leading to 'flied lice' rather than 'fried rice' (Carson, 2009). In Malaysia, for example, due to the national language is a phonetic language in which there is a direct link between the spelling and the sound, the non-native English speakers particularly tend to pronounce English words based on their spellings. The word 'isle' is often mispronounced as /ˈɪslə/ which is supposed to be pronounced as /aɪl/. Hence, it is to say there is still bottom billion that forms the majority of the community are yet to be ready to pronounce correctly.

Mispronunciation is the obvious element distorting effective communication. Incorrect pronunciation makes comprehension difficult and it is frustrating to listeners. More seriously, mispronunciation leads to misunderstanding and embarrassment. The globalised educational networks and commercial industries particularly require people to communicate with their counterparts across borders. Miscommunication may thus cause unpleasant social relationships and the loss of opportunities.

To address the issues of mispronunciation across all cultures, this study designed and developed 'epronounce' by optimizing the universally agreed system of phonetic symbols, the International Phonetic Alphabet (IPA) throughout the whole repository to support personalized one-to-one

learner-centred learning of correct pronunciation among non-native English speakers. It serves as a complementary learning aid by extending the physical reach of real-time pronunciation resources, particularly where onsite English teacher is not available or there is a shortage of qualified English teachers.

The 'epronounce' in this study is an interactive multimedia pronunciation learning management system, specially designed and developed for non-native English speakers to improve their pronunciation accuracy. The 'epronounce' is a dynamic website with database management system and web applications. The data can be edited, customized and upgraded easily and unlimitedly according to the current needs without the demand of having expertise in programming. Learners will always have real-time up-to-date information. The home page of 'epronounce' is illustrated in Figure 1.

Figure 1 The home page of 'epronounce'

Background

To establish foundation for the study, a preliminary survey was conducted on 18 teachers from 11 different schools on the teaching and learning of English pronunciation in schools in Malaysia.

The findings of the preliminary survey demonstrated 88.9 per cent of the teachers agreed that students have problems in pronouncing English words correctly, and 88.9 per cent agreed that phonetic symbols are useful in learning English pronunciation. Fraser (2000) observed that many students still encounter major hurdles with English pronunciation even after years of learning the language. This is mainly due to most of them pronounce English words by referring to their spellings, which is also found by 94.4 per cent of the teachers in the preliminary survey. English is a non-phonetic language in which there is no direct relationship between the spelling and the sound. Only a small number of letters are used to represent the basic sounds or phonemes of the spoken language as the rules governing grapheme-phoneme correspondence in English orthography are irregular (Lee, Stigler & Stevenson, 1986). For example, '**ch**' for the word '**ch**ore' is pronounced as /tʃ/, but the same letters '**ch**' for the word '**ch**oral' is pronounced as /k/. The inconsistencies between written letters and spoken sounds in English often result in mispronunciation. However, this approach of using spelling to pronounce English words is still repeated in the new Malaysian Primary School Standard Curriculum though phonetic symbols have been added on.

The chief principle of the IPA is providing one unique symbol for one discrete sound and the symbol is used consistently for all languages (The International Phonetic Association, 2003). As there is no overlapping of sounds, the phonetic symbols reduce the ambiguities and it is easier for non-native English speakers to understand and to perceive sounds correctly. Therefore, phonetic symbols are essentially needed for phoneme representation in order to learn correct pronunciation.

Close to 90 per cent of the teachers in the preliminary survey indicated that students do not know how to use phonetic symbols though they have widely seen phonetic symbols in dictionaries whether in printed or digital forms, or smartphone apps. They are aware of the existence of phonetic symbols but are unclear of its usage.

The issues of correct pronunciation have long been the concern in English language teaching and learning, especially in non-native English speaking countries. Therefore, this study investigated innovative solution to this problem with 'epronounce' by optimizing the capacity of phonetic symbols, mouth movements and face gestures without mere reliance on ear, as presented in Figure 2, 3 and 4. In order to demonstrate the articulation manner for correct pronunciation with phonetic symbols, the visual demonstration of mouth movements and face gestures enhances the learners' speech production by visually and verbally guiding the learners through the pronunciation learning process in supplementing the phonetic symbols. There are 83.3 per cent of the teachers in the preliminary survey agreed that observing visual demonstration, such as mouth movements and face gestures is useful in learning pronunciation. The areas of auditory cortex of human brains are activated in hearing when the learners follow the mouth movements or face gestures of a sound production (Calvert et al., 1997).
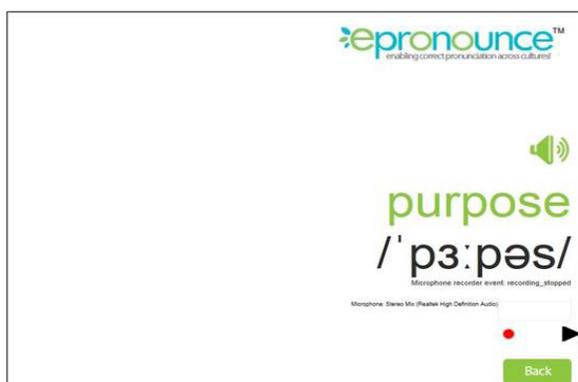

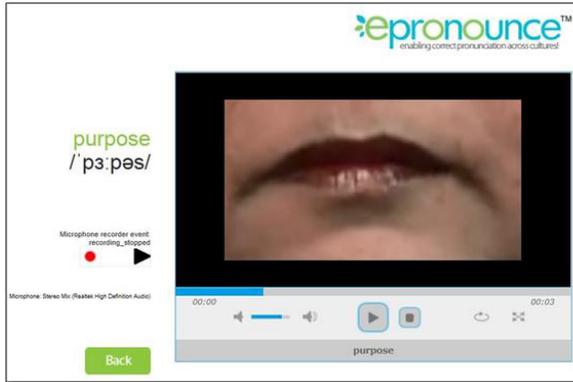**Figure 2** Text + Sound + Phonetic Symbols (TSP)

Figure 3 Text + Sound + Phonetic Symbols + Mouth Movements (TSPM)

Figure 4 Text + Sound + Phonetic Symbols + Face Gestures (TSPF)

To design and develop the feasible and enticing 'epronounce', factors affecting pronunciation acquisition are studied to determine the effectiveness of the multimedia instructional design. In the study of Gömleksiz (2001), it is noted that non-native speakers encounter problems in the learning of new language owing to some contributory factors, for instance, the level of cognitive development, psychological profiles and cultural background. According to Baker (2008), individual differences influence learners to perceive and produce non-native language accurately. Factors affecting

pronunciation acquisition lie primarily in the learners themselves. Hence, specifically in this study, factor within the students which is language anxiety is brought exclusively into focus. Studies conducted by Shute and Gawlick-Grendell (1994), Fong (2000), Li (2008) and Aldalalah (2010) showed that the learning outcomes of students are considerably improved when the modes of instruction are adapted to their psychological profiles. The matching and mismatching of instructional design features have significant effects upon learning outcomes.

Clinical experience, empirical findings and personal reports attest to the existence of anxiety reactions with respect to language learning in individuals (Horwitz, 2001). Language anxiety is an individual's likelihood of becoming anxious in the language classroom, particularly for second/foreign language. When anxiety is limited to the language-learning situation, it falls into the category of situation-specific anxiety (Horwitz, Horwitz & Cope, 1986). Language anxiety generally has a debilitating effect on the oral performance of non-native speakers, and it is one of the most highly examined variables in psychology and education (Horwitz, 2001). Specifically, pronunciation is more anxiety-provoking because learners are very self-conscious when they are required to interact with others that might expose their inadequacies. Learners have the self-perception of being incapable to demonstrate competency in second/foreign language skills. They were anxious as to whether they could pronounce correctly, speak fluently and produce language grammatically correctly in public. Young (1991) argued that when learners are asked to deliver their thoughts or idea with second/foreign language in which they have limited competence, their performance can be very threatening to their self-image. In such an environment, learners' affective filters screen out many meaningful language messages, and thus reducing learners' learning performance, which is explained in the affective filter of Krashen's Second Language Acquisition Theory (Krashen, 1985, 1999, 2005). In the Affective Filter principle, Krashen claimed that there exists a 'filter' or 'mental block' that impedes input from reaching the learners' language acquisition device. When the anxiety level is high, the affective filter is high. The study of Price (1991) found that participants rated speaking in the target language in front of the class was the most anxiety-provoking. They expressed fears of being laughed at and embarrassing themselves. The students also cited frustration

over not being able to express themselves properly in the target language. Many said that they worked harder in their oral class than in any other class but the results were not as well. In fact, the nature of pronunciation learning is a source of language anxiety. Finding a more efficient and less anxiety-producing means to learn pronunciation may, in turn, improve learners' confidence. Creating a secure learning atmosphere and providing opportunities for the learners to make choices about their learning pace are feasible alternative to help reduce language anxiety.

In respond to the research area of this study, language anxiety is included to investigate its moderating effect in the achievement scores among learners with different levels of language anxiety in using TSP, TSPM and TSPF modes of 'epronounce'. The research framework of this study is illustrated in Figure 5.
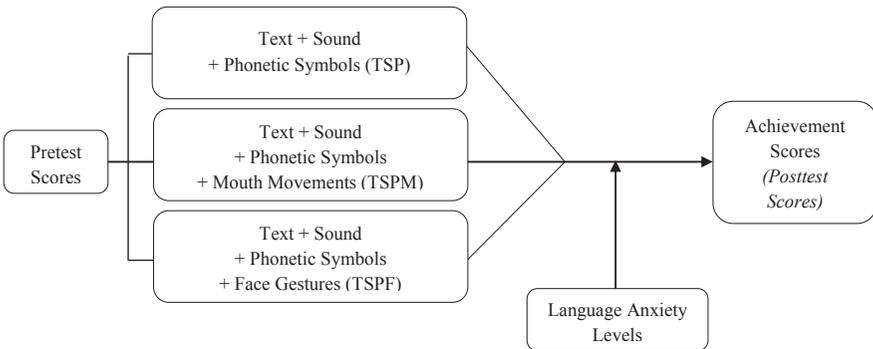

Figure 5 Research framework

The purpose of the study was to determine whether there is any significant difference in achievement scores among learners with different levels of language anxiety in using TSP, TSPM and TSPF modes. To that end, the following questions were addressed:

1. By using 'epronounce', will the students with different levels of language anxiety attain significantly different achievement scores in the three presentation modes?

2. Will students with medium language anxiety attain significantly higher achievement scores than students with low language anxiety in the three presentation modes?

3. Will students with medium language anxiety attain significantly higher achievement scores than students with high language anxiety in the three presentation modes?
4. Will students with low language anxiety attain significantly higher achievement scores than students with high language anxiety in the three presentation modes?

Method

Research Design

To investigate the effects of TSP, TSPM and TSPF on students with different levels of language anxiety, this study employed 3x3 quasi-experimental factorial design. The factorial design of the study is schematically depicted in Figure 6.

Language Anxiety				
	Low			
	Medium			
	High			
		TSP	TSPM	TSPF

Figure 6 Presentation Modes × Language Anxiety
– A 3 × 3 Quasi-Experimental Factorial Design

The variables of this study are presented in Figure 7 below:

Covariate	Independent Variable	Moderator Variable	Dependent Variable
• Pretest Scores	• TSP • TSPM • TSPF	• Language Anxiety Levels	• Achievement Scores (Posttest Scores)

Figure 7 Research variables

Research Samples and Sampling

This study was conducted on 373 Primary Five non-native English speaking students (aged 11) from three different schools equipped with computer laboratories, but 44 students from the overall number did not manage to complete the experiment and tests required in the study. Therefore, the final total sample size calculated for analysis purposes in the study was 329. All the samples were taken from their normal intact classes, and there were a total of eleven classes involved in the study. They were randomly assigned to one of the three modes of 'epronounce' (TSP, TSPM and TSPF).

Stratified random sampling was employed in this study to ensure each cell had sufficient samples. A random distribution of treatment groups from each strata was performed. These subsets of the strata were then pooled to form a random sample. The samples were sorted according to their language anxiety levels based on their scores on Foreign Language Class Anxiety Scale (FLCAS). After filtering and labelling the samples to respective strata, the samples were randomly distributed to either one of the presentation modes using 'epronounce' backend system. For instance, No.1 was for TSP mode, No.2 was for TSPM mode, and No. 3 was for TSPF mode. Every individual could only access to his/her own assigned mode throughout the experiment.

Instruments

There were two instruments used in collecting data which were Pronunciation Competence Test (Pretest and Posttest) and Foreign Language Classroom Anxiety Scale (FLCAS).

(i)   PRONUNCIATION COMPETENCE TEST (PRETEST AND POSTTEST)
        For the purpose of this study, the Pronunciation Competence Test was used as pretest and posttest to evaluate the improvement of participants' pronunciation performance. The posttest achievement scores were used to gauge participants' understanding and application of phonetic symbols while evaluating the effectiveness of using the three presentation modes of 'epronounce' in the learning of pronunciation.

The pretest scores were used as covariate to confirm the participants were at the same starting point to control pre-existing differences between the groups.

(ii)   FOREIGN LANGUAGE CLASSROOM ANXIETY SCALE (FLCAS) The Foreign Language Classroom Anxiety Scale (FLCAS) was employed to assess the participants' language anxiety degree (Horwitz, Horwitz & Cope, 1986). Foreign language classroom anxiety. *The Modern Language Journal, 70*(2), 125-132.) in using 'epronounce' for English pronunciation learning. In this study, participants with FLCAS scores 1 standard deviation (*SD*=0.72) below the sample mean ($\bar{x}\bar{x}$ =2.77) were categorised as low language anxiety, while participants with FLCAS scores in between 1 standard deviation (*SD*=0.72) above or equal to the sample mean ($\bar{x}\bar{x}$=2.77) and 1 standard deviation below or equal to the sample mean were categorised as medium language anxiety. For participants with FLCAS scores 1 standard deviation (*SD*=0.72) above the sample mean ($\bar{x}\bar{x}$=2.77) were categorised as high language anxiety.

Results

The research data was analyzed using analysis of covariance (ANCOVA) to determine main effects and interaction effects between independent variable and moderator variables towards dependent variable while controlling the covariate and to test the hypotheses. Procedures of one-way ANCOVA and two-way ANCOVA were computed only after the assumptions of ANCOVA were conformed.

Presentation Mode and Language Anxiety Level

The two-way ANCOVA was conducted to examine the effects of language anxiety levels on the achievement scores of posttest according to presentation modes using pretest as covariate. Referring to Table 1, there was no significant interaction effect between language anxiety level and presentation mode (FLCAS*Mode), $F_{(4, 319)}$=1.261 at p=0.285. The p-value is greater than the 0.05 statistical significance cut-off level. When p-value is greater than

the significance cut-off level (p>0.05), the interaction is considered not statistically significant (Agresti, 2007; Aschengrau & Seage, 2008; Boyd et al., 2008; Chumney & Simpson, 2006; Riegelman, 2005; Weisberg, 2005). This indicated that students' language anxiety levels did not affect the posttest achievement scores among the three presentation modes. In other words, the effect of presentation modes on the achievement scores did not depend on the language anxiety levels. Due to the between-subjects effect was not significant, the follow-up analysis of pairwise comparisons was not needed to be conducted.

Table 1 Two-Way ANCOVA for posttest scores by presentation mode and language anxiety level with pretest as covariate

Dependent Variable:Posttest

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power[b]
Corrected Model	16731.667[a]	9	1859.074	31.944	.000	.474	1.000
Intercept	13228.556	1	13228.556	227.301	.000	.416	1.000
Pretest	13010.026	1	13010.026	223.546	.000	.412	1.000
FLCAS	7715.003	2	3857.502	66.282	.000	.294	1.000
Mode	461.973	2	230.987	3.969	.020	.024	.710
FLCAS * Mode	**293.571**	**4**	**73.393**	**1.261**	**.285**	**.016**	**.394**
Error	18565.312	319	58.198				
Total	1392755.000	329					
Corrected Total	35296.979	328					

a. R Squared = .474 (Adjusted R Squared = .459)
b. Computed using alpha = .05

Table 2 presented the estimated marginal means and standard errors of the dependent variable by language anxiety levels in the three presentation modes. Estimated marginal means are the adjusted means with the effect of the covariate has been statistically removed. The findings demonstrated that students with medium language anxiety attained the highest achievement scores (adjusted *M*=67.500), followed by students with low language anxiety (adjusted *M*=60.333), and students with high language anxiety attained the lowest achievement scores (adjusted *M*=52.802). The achievement scores for medium language anxiety level were higher than the achievement

scores for low language anxiety level in the three presentation modes, but p=0.285 (p>0.05) as shown in Table 6. This indicated the differences were not significant among the achievement scores. Similarly, the achievement scores for medium language anxiety level were higher than the achievement scores for high language anxiety level in the three presentation modes, but p=0.285 (p>0.05) indicating the differences were not significant among the achievement scores.

Table 2 Estimated marginal means by language anxiety level

Dependent Variable:Posttest

Language Anxiety Level	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low	60.333[a]	1.060	58.247	62.418
Medium	67.500[a]	.518	66.480	68.520
High	52.802[a]	1.202	50.438	55.167

a. Covariates appearing in the model are evaluated at the following values: Pretest = 44.48.

The results of the two-way ANCOVA shown in Table 3 provided the adjusted means on the dependent variable for each group, split according to the level of language anxiety separately. Adjusted means refers to the fact that the effect of the covariate has been statistically removed. The findings demonstrated the adjusted means for the three presentation modes by low, medium and high language anxiety levels. For low language anxiety level, the adjusted means were reported as 58.832 for TSP mode, 60.712 for TSPM mode, and 61.454 for TSPF mode; while for medium language anxiety level, the adjusted means were reported as 64.820 for TSP mode, 66.672 for TSPM mode, 71.007 for TSPF mode. The achievement scores for low language anxiety level were higher than the achievement scores for high language anxiety level in the three presentation modes, but p=0.285 (p>0.05) indicating the differences were not significant among the achievement scores.

Table 3 Estimated marginal means by language anxiety level and presentation mode

Dependent Variable:Posttest

Language Anxiety Level	Presentation Mode	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Low	TSP	58.832[a]	1.805	55.280	62.384
	TSPM	60.712[a]	1.923	56.928	64.496
	TSPF	61.454[a]	1.688	58.134	64.775
Medium	TSP	64.820[a]	.881	63.087	66.554
	TSPM	66.672[a]	.852	64.996	68.348
	TSPF	71.007[a]	.930	69.177	72.837
High	TSP	53.528[a]	2.345	48.914	58.142
	TSPM	50.522[a]	2.049	46.491	54.552
	TSPF	54.358[a]	1.680	51.052	57.663

a. Covariates appearing in the model are evaluated at the following values: Pretest = 44.48.

Discussion

Effects of Language Anxiety Levels With Presentation Modes on Pronunciation Learning

The results of this study showed that there are no significant interaction effects between language anxiety levels and presentation modes of 'epronounce'. Seemingly 'epronounce' is able to bring the students to medium language anxiety level and hence optimising pronunciation learning, which is in line with the curvilinear relationship between anxiety and performance as described in the Yerkes-Dodson law (Yerkes & Dodson, 1908; Keeley, Zayac & Correia, 2008).

These findings are inline with research by Beauvois (1997, 1998) involving fourth-semester French students who were engaged in multimedia learning performed significantly better on oral exams than the students who discussed the contents face-to-face in traditional formal class. Beauvois (1997, 1998) suggested the results are due to the fact that in multimedia learning students can and usually do participate more actively because of the low threatening atmosphere. This is in line with the Affective Filter principle of Krashen's Second Language Acquisition Theory (Krashen, 1985, 1999, 2005). Krashen claimed that the best language acquisition takes place in an

environment where anxiety level is low and defensiveness absent, or in another term where the affective filter is low. A low filter is associated with relaxation, confidence to take risks and a conducive learning environment which has been created by 'epronounce' in this study. Krashen showed that students whose anxiety level is low are much more likely to be successful language acquirers. Learning with 'epronounce', the students are more willing to practise their pronunciation because the mistakes made would not cause them to feel embarrassed in front of others. This situation motivates the students to practise more and improve gradually. For instance, students with low pronunciation abilities may not feel intimidated to practise the sounds orally. Besides, shy or introverted students manage to overcome the barrier of having to pronounce the sounds out publicly. Therefore, 'epronounce' enables students to acquire pronunciation competence without suffering embarrassment in front of others. On the contrary, when students sitting in traditional formal class, the high anxiety students tend to be very anxious about the possibility of being called on, they may not pay attention to what the teacher is saying and will benefit very little from being in class. In their comprehensive studies, for example, Warschauer (1996), Beauvois (1998) and Meunier (1998) reported that multimedia learning caused little to no stress. As a result, even reticent students who tend not to participate in oral classroom discourse often become active contributors in the multimedia learning setting (Kelm, 1992; Kern, 1995; Warschauer, 1996; Beauvois, 1998; Meunier, 1998). It appears that multimedia learning setting provides enough practice and positive experiences for students to become generally more engaged in second/foreign language learning (Payne & Whitney, 2002; Roed, 2003; Arnold, 2007; Rahimi & Yadollahi, 2011; Huang & Hwang, 2013). By giving students a chance to learn privately, 'epronounce' provides students with meaningful inputs and encourages them to actively practise pronunciation. Findings of this study suggest that 'epronounce' functions as a practice platform for pronunciation learning not only in terms of pronunciation competence but also with regard to students' affective state in which students are seemingly more confident and engaged during learning sessions with 'epronounce'.

The 'epronounce' has also shown promise in bringing students to medium language anxiety level for optimised learning by providing them student-centred learning approach. By clicking on the links of every screen, the

students are able to select the lessons they want to explore. The 'epronounce' encourages self-paced, self-accessed, self-controlled, self-enhanced and self-directed learning. It guides the students systematically but at the same time gives the students freedom to learn at their own pace. They can start and stop the lessons at a pace efficient to them as well as review the lessons when they misunderstand certain speech sounds or miss the details. In a controlled multimedia learning environment, the students are likely to be more engaged. This also provides opportunities for autonomous practice. The students make the decisions about when, where, what and how quickly to learn. Control of the learning process encourages active learning and is highly beneficial to the students (Sullivan, 2001). The students will also learn to be more independent in creating their own learning steps. This has definitely helped the high language anxiety students from being frustrated and the low language anxiety students from getting bored. The 'epronounce' provides students with the means to control their own learning, to construct meaning and to evaluate and monitor their own performance. As a result, the students have more time to plan and monitor their own progress as well as process input, thereby compensating for the cognitive interference of anxiety at the input, processing and output stages (Fong, Por & Tang, 2012). Furthermore, 'epronounce' is designed by allowing the students to interact with the contents, such as associative animations and enhancement quizzes. This makes pronunciation learning effective and the students are full of interest to improve their pronunciation. The 'epronounce' has redefined the functions of technology from teacher-centred to student-centred by placing the power of learning more in the hands of the students.

The students also feel more at ease with 'epronounce' because it is a forgiving and patient tutor (Lai, 2006) of willingly repeating the sounds for the students ad infinitum with reliable quality in the sense of being the same every time (Pennington, 1999). Contrary, in traditional formal class setting, the students experience fear when attempting to ask the human teachers to repeat the sounds many times because teachers may become impatient and other students may also get irritated. In the context of this study, with 'epronounce', the language anxiety of the students is addressed as the students get more chance to immerse themselves in a second/foreign language environment without fear and their pronunciation competence is enhanced. Torgesen

(1995) and Levis (2007) affirmed that pronunciation competence can be improved with multimedia learning. By increasing the frequency of listening to correct pronunciation with phonetic symbols, watching the videos of mouth movements or face gestures as many times as the students desire, the students are trained to be active, independent and critical in sound discrimination and sound production during the information processing procedures.

The efficacy of 'epronounce' with multichannels of media to transmit information has also tremendously enhanced comprehension, and thus brings the students' language anxiety to medium level which optimises their learning. The 'epronounce' with the innovative use of texts, graphics, animations, videos and audios, and interactivity gives the impetus to students to be more attracted to learning and therefore pay more attention to pronunciation learning. This in fact stimulates the verbal and visual channels of the students. The various inputs increase students' interest, and help establish connections between the abstract and the concrete (Boyd & Murphrey, 2002; Wald, 2008). The 'epronounce' makes the invisible sound become visible, and concrete graphics appear in front of the students. The students learn to pronounce the sound not only by listening, imitating and repeating, but also seeing the phonetic symbols and the mouth movements as well as the face gestures. In fact, according to Baddeley's Model of Working Memory (2000), there are two independent processors, the phonological loop and the visuospatial sketchpad for verbal and visual contents respectively. When the contents are presented in more than one sensory modality, the working memory capacity increases which helps increase students' language comprehension. These two channels reinforce each other and enhance both recall and comprehension. Tsou, Wang and Tzeng (2006) contended that students using multimedia learning can recall more content of second/foreign language learning and demonstrate better language proficiency. In accordance with the Second Language Acquisition Theory (Krashen, 1985, 1999, 2005), Krashen proposed that students can learn a large amount of language unconsciously where there is ample comprehensible input. In other words, language acquisition only takes place when comprehensible input is delivered sufficiently. Following Mayer's Cognitive Theory of Multimedia Learning (2001), humans are dual-channel processors, that is, people have separate channels for processing auditory/verbal information and visual/pictorial information. For example, the sounds of the phonetic symbols

are processed in the auditory/verbal channel and the associative animations are processed in the visual/pictorial channel. Humans are knowledge constructing processor, so meaningful learning occurs when people attend to relevant incoming information, mentally organise the information in coherent structures, and mentally integrate it with other knowledge. In this respect, the 'epronounce' is designed and developed in light of how the human mind works which leads to meaningful learning. With the combination of various digital media types, such as texts, graphics, animations, videos and audios, into an integrated multisensory interactive application or presentation, 'epronounce' helps students to learn pronunciation in more an interesting way and engage in the pronunciation learning environment which makes them enjoy the learning process and brings them to medium language anxiety level which optimises their learning. Moreover, the interactive real-time record-play function which allows the students to record their own pronunciation and play back for listening to compare with the model pronunciation helps the students immerse in the world of pronunciation learning. Immersion has been said to have a positive impact in students' learning (Warburton, 2009). Immersion encourages the students to engage with 'epronounce' and changes the role of the students from passive contemplation to active participation (Pholke, 2007) which is, in turn, an essential factor for successful pronunciation learning.

Hence, pronunciation learning involves not only a cognitive process, but also a psychological process. The 'epronounce' has seemingly brought the students to medium language anxiety level which optimises their pronunciation competence. In regard to the private learning environment provided by 'epronounce', the high language anxiety students manage to reduce their anxiety level. Moreover, the student-centred learning approach in 'epronounce' helps the high language anxiety students from being frustrated and the low language anxiety students from getting bored. The efficacy of 'epronounce' with multi channels of media also engages the students in pronunciation learning which in turn changes the role of the students from passive contemplation to active participation. Therefore, 'epronounce' functions as a positive platform not only in terms of pronunciation competence but also with regard to students' affective state.

Limitations of The Study

This study has a limitation of age range as it only focuses on Primary Five students whose pronunciation skills are at the beginning level. The amount of time for the students to participate in this study is limited to five sessions with 30 minutes each. The learning modules are specific to English pronunciation at segmental level. Therefore, wider generalisation to suprasegmental level and other aspects of language acquisition cannot be applied.

Conclusion

The statistical results showed no significant difference among achievement scores attained by students with different levels of language anxiety in the three presentation modes. This implies that 'epronounce' provided equivalent benefits to students irrespective of their different language anxiety levels.

With the innovative use of texts, graphics, animations, videos and audios, and interactivity gives the impetus to students to be more attracted to learning and therefore pay more attention to pronunciation learning. The various inputs increase students' interest and motivation, and help establish connections between the abstract and the concrete (Boyd & Murphrey, 2002; Wald, 2008). The 'epronounce' makes the invisible sound become visible, and concrete graphics of face gestures appear in front of the students. In accordance with the Second Language Acquisition Theory (Krashen, 1985, 1999, 2005), Krashen proposed that students can learn a large amount of language unconsciously where there is ample comprehensible input. In other words, language acquisition only takes place when comprehensible input is delivered sufficiently. This is another important theoretical implication of this study denotes the combination of various digital media types into an integrated multisensory interactive application ease students' understanding and engaging in non-anxiety-provoking learning environments helps students to enjoy the learning process and lowers the inhibition.

With the complexity of human psychological profiles and the proliferation of technology, this study emphasizes on using pedagogy in

technology. The students perform better when they receive instruction that responds to their needs. It is not the nature of technology that determines the successful learning outcomes, but pedagogy which is well employed. Therefore, the empirically-supported instructional strategy provided in this study is the essential step in any innovative process, particularly in promoting meaningful pronunciation learning among learners from non-native English speaking background.

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