ผลของการใช้วิธีการริธึมในบทเรียนสื่อประสมและการเปิดรับการเรียนรู้ต่อผลสัมฤทธิ์ของการออกเสียงภาษาอังกฤษของนิสิตระดับบัณฑิตศึกษาไทยและจีนที่มีรูปแบบการเรียนรู้ต่างกัน

นางสาวจุฬาภรณ์ กองแก้ว

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EFFECTS OF RHYTHMIC METHOD IN MULTIMEDIA LESSONS AND LEARNING EXPOSURE UPON ENGLISH PRONUNCIATION ACHIEVEMENT OF THAI AND CHINESE UNDERGRADUATES WITH DIFFERENT LEARNING STYLES

CHULAPORN KONGKEO

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Field of Study	Educational Communications and Technology
Thesis Advisor	Chawalert Lertchalolarn, Ph.D.
Thesis Co-advisor	Professor He Ruiyong, Ph.D.

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จุฬาภรณ์ กองแก้ว : ผลของการใช้วิธีการริธึมในบทเรียนสื่อประสมและการเปิดรับการเรียนรู้ต่อผลสัมฤทธิ์ของการออกเสียงภาษาอังกฤษของนิสิตระดับบัณฑิตศึกษาไทยและจีนที่มีรูปแบบการเรียนรู้ต่างกัน (EFFECTS OF RYTHMIC METHODS IN MULTIMEDIA LESSONS AND LEARNING EXPOSURE UPON ENGLISH PRONUNCIATION ACHIEVEMENT OF THAI AND CHINESE UNDERGRADUATES WITH DIFFERENT LEARNING STYLES) อาจารย์ที่ปรึกษา: อ.ดร. เชาวเลิศ เลิศชโลฟ้าร, อาจารย์ที่ปรึกษาร่วม ศาสตราจารย์ ดร. HE RUIYONG, 100 หน้า. ISBN 974-17-9848-2

การวิจัยนี้มีวัตถุประสงค์เพื่อ 1) เปรียบเทียบผลสัมฤทธิ์ทางการเรียนการออกเสียงคำในภาษาอังกฤษที่ได้รับจากบทเรียนสื่อประสมที่ใช้วิธีการริธึมที่ต่างกัน 2) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนการออกเสียงคำในภาษาอังกฤษที่ได้รับจากบทเรียนสื่อประสมที่ใช้วิธีการริธึมต่างกันและได้รับการเปิดรับการเรียนรู้โดยมีกลุ่มที่ได้รับกิจกรรมการฝึกและกลุ่มที่ไม่ได้รับกิจกรรมการฝึก 3) เพื่อเปรียบเทียบผลสัมฤทธิ์ทางการเรียนการออกเสียงคำในภาษาอังกฤษที่ได้รับจากบทเรียนสื่อประสมโดยที่ผู้เรียนมีรูปแบบการเรียนรู้ต่างกัน 4) เพื่อศึกษาว่าปัจจัยต่าง ๆ ที่ศึกษาในการวิจัยครั้งนี้มีความสัมพันธ์กัน และ 5) มีอิทธิพลต่อผลสัมฤทธิ์ทางการเรียนการออกเสียงคำในภาษาอังกฤษหรือไม่ กลุ่มตัวอย่างในการวิจัยครั้งนี้คือ นิสิตและนักศึกษาชั้นปีที่ 1 ระดับปริญญาบัณฑิตชาวไทย จำนวน 59 คน และ ชาวจีน จำนวน 38 คน ตัวแปรอิสระที่ศึกษาคือ บทเรียนสื่อประสมที่ใช้วิธีการสอนที่ออกแบบต่างกัน การเปิดรับการเรียนรู้ และรูปแบบการเรียนรู้ที่ต่างกัน บทเรียนสื่อประสมใช้วิธีการสอน 2 แบบ คือ ball และ color bar queuing การเปิดรับการเรียนรู้ถูกศึกษาในรูปแบบของการจัดกิจกรรมการฝึกในห้องเรียนและรูปแบบการ เรียนรู้แบ่งเป็น 3 ประเภท คือ visual, audio และ kinesthetic ซึ่งรูปแบบการเรียนรู้นี้ได้รับการออกแบบโดย Ried แบบแผนการวิจัย คือ การวิจัยเชิงทดลอง สถิติที่ใช้ในการวิเคราะห์ข้อมูลคือ t-test การวิเคราะห์ความแปรปรวนทางเดียวและการวิเคราะห์ความแปรปรวนหลายทาง

ผลการวิจัยพบว่า 1) ผลสัมฤทธิ์ของทั้งนิสิตไทยและนักศึกษาจีนที่ได้รับจากการเรียนรู้บทเรียนสื่อประสมที่ใช้วิธีการริธึมที่ต่างกัน ไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับนัยสำคัญ 0.05 2) ผลสัมฤทธิ์ระหว่างนิสิตไทยและนักศึกษาจีนที่ได้รับจากการเรียนบทเรียนสื่อประสมที่ใช้วิธีการริธึมต่างกันไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับนัยสำคัญ 0.05 3) ส่วนผลสัมฤทธิ์ทางการเรียนของนิสิตไทยและนักศึกษาจีน 4) ผลสัมฤทธิ์ทางการเรียนระหว่างนิสิตไทยและนักศึกษาจีนที่ได้รับกิจกรรมการฝึกและไม่ได้รับกิจกรรมการฝึกไม่ต่างกันอย่างมีนัยสำคัญแต่ผลสัมฤทธิ์ทางการเรียนของนิสิตไทยและนักศึกษาจีนที่มีรูปแบบการเรียนรู้ที่ต่างกันมีความต่างกันอย่างมีนัยสำคัญทางสถิติที่ระดับนัยสำคัญ 0.05 โดยนิสิตและนักศึกษาที่มีรูปแบบการเรียนรู้แบบ visual มีผลสัมฤทธิ์สูงสุด และเป็นปัจจัยที่มีอิทธิพลต่อผลสัมฤทธิ์ทางการเรียนของนิสิตไทยและนักศึกษาจีน 5) โดยปัจจัยที่มีอิทธิพลต่อผลสัมฤทธิ์ทางการเรียนระหว่างนิสิตไทยและนักศึกษาจีนไม่มีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติที่ระดับนัยสำคัญ 0.05

ภาควิชา โสตทัศนศึกษา ..... ลายมือชื่อนิสิต .....

สาขาวิชา เทคโนโลยีและสื่อสารการศึกษา ..... ลายมือชื่ออาจารย์ที่ปรึกษา .....

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ADVISOR : CHAWALERT LERTCHALOLARN, Ph. D. CO-ADVISOR : Professor HE RUIYONG, Ph.D.
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The objectives of this research were 1) to compare learning achievements gained from different designs of multimedia pronunciation lessons, 2) to compare the learning achievements of students who have received practice activities with that of those who have not, 3) to compare the learning achievements of students who have different learning styles, 4) to identify interaction effects of factors that influence learning achievements of students, and 5) to compare the factors that influence learning achievements of Thai with that of Chinese students. The subjects of this study were 59 Thai and 38 first-year Chinese undergraduates. The subjects of this study were 59 Thai and 38 Chinese first-year undergarduates majoring Sciences. Three independent variables were studied. First, there were two designs of rhythmic methods: a ball and a color-bar queuing. Secondly, the learning exposure studied was in four classroom practice activities. Lastly, the Reid's learning style preference survey was applied, and the learning styles were labeled as visual, audio, and kinesthetic. The dependent variable was the learning achievements of the students. T-test, one-way ANOVA, two-way ANOVA, and Multiple Variance were used to analyze the results obtained from the study.

The research findings were that 1) there was no significant difference on the learning achievements of Thai and Chinese students using from different pronunciation multimedia lessons, and 2) between Thai and Chinese students at the level of significance 0.05. In addition, 3) there was no significant difference on the learning achievements of Thai and Chinese students who have received practice activities and no practice activities, and between Thai and Chinese students at the level of significance 0.05. However, 4) there was a significant difference on the learning achievements of Thai and Chinese students who have different learning styles, between Thai and Chinese students who have different learning styles also at the level of significance 0.05. Finally, 5) it was observed that there was no correlation among factors that influence learning achievements of Thai and Chinese students, and between Thai and Chinese students at the level of significance 0.05.

Department Audio-Visual Education Student's signature _____
Field of study Educational Communication and Technology Advisor's signature _____
Academic year 2002 Co-advisor's signature _____

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CHAPTER 1
Introduction

1.1 Rationale

During the past decade, educational technologies have played an important roles in instructional processes as we can see from National Education Act B.E. 2542 [(1999) Chapter 9: section 66], which states that learners shall have the right to develop their capacities for utilization of technologies for education as soon as possible so that they shall have sufficient knowledge and skills in using these technologies for acquiring knowledge themselves on a continual lifelong basis.

With the new law encouraging the utilization of technologies, a lifetime of learning is now just a click away since the educational reform allows merging the advances of technologies with the conventional means of academic process. Quality education for learners should prepare them to be technologically skilled in their search for knowledge both inside and outside of conventional classrooms where the information is prepared in sequence and given to the learners, who are relegated to the roles of passive participants. However, they do not learn to self-regulate (Wood, Bruner, & Ross, 1976 cited in Nicaise and Crane, 1999), since this does not enhance the effective skills that learners require in continuing the learning anywhere and anytime. Lloyd (1997) stated that technology could now support the ability of instructors to enhance the learning process, and instructors are indeed on the threshold significant breakthroughs in the new learning process. The use of technology is not about how many bells and whistles we can add to the classroom; it is about empowering the learners. It is about encouraging students to leave behind the notion that learning means rote memorization; it is about exploration and the realization that there are multiple pathways to knowledge (Armstrong and Yetter-Vassot, 1994).

As far as it is concerned, Thailand's knowledge transfer system has been in the form of the knowledge memorization for a long time (Soo-amphan, 2000). Good students are those who pass examinations on science and mathematics with good scores. Those with artistic and music ability cannot hope to make reputation for schools. Learning has become suffering and no fun for learners. Phenomenon in

which children prefer to go for tutoring to quickly pass examinations of certain subjects may be a means of avoiding from suffering through receiving knowledge at school. However, memorizing as much given information as one can does not signify one's full potential. Likewise, one who cannot memorize the given information or achieve high scores in an examination should not be considered incapable.

With the help of educational technology, any learner is entitled to learning at his/ her own pace as well as with his own learning style. Neither distance nor time constraints affect learning achievement, along with potentiality in a learning process. Brown (1999) pointed out three advantages of the use of computer technology in a classroom. Initially, the learner can work privately without anyone else observing the task level or any errors being made. Secondly, computers allow for flexible access as learners can use computers at times that suit them, either during or in addition to class times. Flexible access also means that expensive resources are being used more efficiently. Thirdly, computer-managed-learning can be a cost-effective way to provide individualized teaching and to coordinate and manage learning and assessment.

The vision emphasizing how significant the use of technology could affect the ways learners learn and the benefits they make the whole life through is widespread not only in western countries but also in Asian countries. Cheng (1999) recently noted that for Hong Kong citizens a quality education should prepare students to be 1. lifelong learners, 2. able communicators in their native tongue and in English, 3. technologically skilled for the workplace and daily life, cognitively prepared for problem-solving, and the creation of knowledge, and 4. politically and culturally aware and responsible citizens. Kaewdang (2000) affirmed that education must aim for full development of students in all aspects: physical and mental health, intellect, knowledge, morality, and integrity so that they can lead a desirable way of life and live in harmony with other people. In accordance with the development of students in English, computer knowledge and skills are essential to maintain life in the globalized world.

As the paradigm in educational realm has shifted from a teacher-centered mode to student-centered instruction, new computer technologies are usually incorporated into such instruction, thus more or less leading to the social and education development (Thongrin, 2000). As regard, educational institutions and agencies concerned shall enables individuals to learn at all times and in all places at

ones' own pacing. Educational technology is the answer. Today, there is an array of educational technology available ranging from pictures, cassette tapes, videotapes, and multimedia through the World Wide Web. Considered a rich learning environment, multimedia provides a higher level of mastery over the subject matter. It gives students "hands-on" learning, better retention, specific feedback, and increased levels of understanding [Roden (1991); Gayeski (1998)]. This is because multimedia involves the integration of more than one medium into a form of communication.

Multimedia such as slide or tape presentations, interactive videos, and video productions have been available for a long time. This term now commonly refers to the integration of media such as text, sound, graphics, animation, video, imaging, and spatial modeling into a computer system (Jonassen, 1994). The samples given in the study of Reeves (1998) illustrated how fascinating and motivating multimedia could hold the attention and interest of all learners. Imagine a teacher with the capability to bring to life any image, any sound, and event. Imagine a student with the power to visit any place on earth at any time in history. Imagine a screen that can display in vivid color the inner workings of a cell, the births and deaths of stars, the clashes of armies. Multimedia bring to bear dynamic visual information in the form of full- motion video that gives learners a direct pipeline into the brain. As human beings, learners process that data very efficiently (Taylor, 1990).

The power of full-motion video combined with interactivity allows every person to discover knowledge in the pattern that best fits their paradigm for learning; the way they learn best, individualized. This kind of learning environment provides a better understanding and serves different learning styles with several pathways within the same material [Sculley (1988); Gayeski (1998)]. Furthermore, a computer can also be a devise, as stated in Glyn (1991), which creates opportunities to practice target behavior and to achieve the intended purposes.

The remarkable attributes making multimedia to encourage and to empower learners to develop the notions of learning and knowledge at their own pace and with their own style are Hypertext and Hypermedia.

Janassen (1989) describes hypertext as being based on the term "hyper" meaning above, beyond, super, excessive- more than normal. Hypertext is beyond normal text. Normal text is linear, and is constructed to be read from beginning to end, whereas hypertext is a non-sequential, nonlinear method to enable learners to

access information from a text in ways that are most meaningful to them (Nelson, 1981). Like spider webs, nodes of information typically make ways for learners to control what they want to access in a sequence that appear personally meaningful. The organization of a hypertext- the interrelationships among the nodes- is defined by the links that connect them. Links in hypertext systems typically describe associations between the nodes they connect. Links may consist of highlighted words, in which case a learner point at and click on the word to learn more about it.

Likewise, hypermedia is a marriage of multimedia and hypertext (Jonassen, 1989). Hypermedia nodes may consist of different media forms. A node may be text, but it also maybe a graphic image, a sound bite, an animation sequence, or a video clip. So rather than pointing to a hot button to retrieve a textual description of the Battle of Gettyburg, the learner may retrieve video clips from the movie, an animated sequence of the development of the battle, actual pictures taken at Gettyburg, or all of the above (Janassen, 1994). Hypermedia provides sensory data, which can both capture learners' interest and integrate information quite well.

Hypertext and hypermedia contribute a great deal to the educational arena, according to researchers such as Marchionini, (1988), and Sharp, (1996). First, students have quick and easy access to large amounts of information in a variety of formats. Second, the environment offers a high level of learner control because users may choose predetermined paths through the lesson or paths that suit individual interests and abilities.

Although multimedia possibly provides learners with an array of options- hypertext and hypermedia, those options are likely to result in difficulty unless learners are facilitated and given some useful directions at the first stage (Brown, 1999). Knowing how the information has been organized is a beneficial in that they can lead their way of accessing, restructuring, and finally synthesizing new knowledge.

Actually, there are many commercial programs from tutorials, drills and practices, simulations, and instructional games, to tests that incorporate a hypertext and hypermedia interface. How can we – educational technologists, educators, teachers, and students- make sure that we are not bombarded with irresistibly beautiful layouts without constructing any notions of learning nor knowledge.

A well-designed multimedia should be based upon the foundation of the man-computer interaction (Linder and Assink, 1994). The highlights of the design of the

man-computer interaction are that the sequencing of the learning content presented prioritizes from simple to complex, from concrete to abstract, and from foundation to application. The presentation of information on the screen encourages learning capability. The format of student input and feedback keeps consistency so that a student does not waste time getting himself accustomed to its different pattern.

As a consequence, this study aims at designing and investigating the effects of carefully planned interactive multimedia on the new learning paradigm-learner-centered in the case of a small subject area brings most Thai students out in a sweat: English Pronunciation.

The reason for the importance of English is that it is a medium for international communication (Harrison, 1974) and its roles in communication are increasing on a daily basis. Starting with the concept of globalization, wherever you are in this world, you can access information. Is that information provided in your native language? In Thai? English plays an important role being a medium of communication. Moreover, in the global market place, having a workforce that can communicate effectively in English will greatly enhance Thailand's competitive position (Dabbs, 2001).

Thus, it is not exaggerated to state that English is the language of communications and mass media both with the outside world or with the international and foreign business community within the country (Noss, 2000).

English is compulsory as a foreign language taught in Thailand. Starting in the fifth grade in public schools or earlier in private schools, students continue their English study until they finish their high school or college education and higher education. At the university level, English is one of the core disciplinary areas on which the government has placed a high priority (Wongsotorn, 1975). The empirical evidence show that most of the courses given to university students aim at enhancing the reading and writing abilities. Students put a lot of effort on learning vocabulary, structure, and specific learning strategies to accomplish the examinations awaiting once or twice within one semester without realizing that speaking skill is also important to make a successful communication. Thippawan (1982) found that there are factors contributing to success or failure in communication. Pronunciation is one of those factors.

The nature of English and Thai pronunciation is different, though it appears that both languages share many of vowels and consonants.

First, consonants and vowels. Significant differences are found between the phonological systems of Thai and English (Smyth, 1998). In Thai, there are 21 consonant phonemes and 21 vowel phonemes. In the Thai consonant system, the aspirated voiceless stops /p/, /h/, and /k/ are distinct phonemes and not simply allophones of/p/, /t/, and /k/ as they are in English. English has more fricatives than Thai, and Thais tend to have difficulty in producing these (e.g. / /, / /, / /, / /, / / and / /). Moreover, problem arises from the end of syllable sounds: English puts more emphasis on end of syllable sounds than Thai does. Dabbs (2001) claimed that this lack of emphasis when they speak makes understanding English-speaking Thais sometimes difficult. Having them listen to properly pronounced English over and over does not necessarily correct the problem unless it is focused on.

Secondly, stresses. English words possess a stress and it shifts according to the syllables and parts of speech, while Thai words usually get a strong stress on their final syllable. There is also a tendency that Thais give equal weight and timing to each syllable; reduce consonant clusters at the end of words to single consonants.

Thirdly, intonation patterns. Those in Thai are very different to those of English. Being a basically monosyllabic language, Thai has a sharp up-and-down pitch contour. Although questions in Thai are frequently marked by ‘question words’ at the end of a sentence which have an inherent rising tone, this does not automatically facilitate the reproduction of English question contours.

As evidences show that there are three major differences between Thai and English pronunciation, not a single remedial measure is completely effective since learners are individually different. Two empirical support evidences on this view, Wesche (1981). One of which is that the students in a Canadian Public Service Commission language instruction program are divided into three groups: a group with high analytic abilities, one with high memory skills, and one with matched skills. The methodologies offer each group varied: the first group is encourage to analyze: the second is given situation- based material and a great deal of material to memorize, and the third receive more traditional, audio-visual material. There is a significant interaction between learner types and methods: students do especially well when they are matched with the appropriate methodology.

Unarguably, rather than being fixed, instructional method and materials need to be flexible, adjustable, and compatible to learners ability, characteristics, and cultural background as in a tailor-made production.

Tsui (1996) analyzes in her research that Asian students tend to be more reserved and reticent than the westerners. Thai shyness, large classrooms, and the lack of teachers proficient in English are limiting factors to Thais learning English properly ("Thai schools score a 'C' for English", *The Nation*, January 19, 2001).

Apart from the socio-cultural differences, considered internal factors, individual learner differences are also one of the factors significantly affecting the ultimate success of second or foreign language learning (Ellis, 1986). These differences include motivation, learning style, aptitude, and age. These variables, including cognitive styles, result in differences in the route along which each learner passes. As for the cognitive styles, another one of the internal factors, various dimensions of cognitive styles have been identified.

The dimensions of learning style that Reid (1987) mentioned in her study of adult learners of ESL are auditory and visual styles. Visual learners tend to prefer reading and studying charts, drawings, and other graphic information, while an auditory style is characterized by a preference for listening to lectures and audio/ cassette tapes. Most successful learners are found utilizing both visual and auditory input; however, slight preferences one way or the other may distinguish one learner from another, which is considered an important factor for the instruction and the learning process (Brown, 1994).

Reid (1987) reported the use of self–reporting questionnaire, each subject rates his or her own preference. By means of the questionnaire, Asian students are significantly more visually oriented than native English speakers; among Asian students, Chinese are inclined to be the most auditory oriented while Japanese are significantly the least. Nevertheless, Thais are not included in this study.

Schumann and Schumann (1977) pointed out that these factors are difficult to be observed. Therefore, it is recommended that individual learners keep daily records describing experiences learning another language, and that the teacher should implement the use of questionnaires and interviews with individual learners (Naiman et al., 1978 cited in Ellis, 1986). The difficulty found in the latter is learners

tend to say what they think the researchers want to hear, or indulge in self- flattery. Both the dairy and the interview or questionnaire are simultaneously recommended.

Both Reid (1987) and Schumann & Schumann (1977) agreed upon the premise that not only cognitive styles-auditory and visual orientation- that affect the success in learning ESL but also other factors, such as gender, academic field of study, and level of education.

. Hence, neither one exact strategy nor approach works well with all types of learners. Many researchers,namely, O'Malley (1989), O'Malley & Chamot (1990), and O'Malley, Chamot, & Kupper (1989) carried out some finding concerning learning strategies. Strategies involve planning for learning, thinking about the learning and evaluating learning after each task is completed. The manipulation of the material itself also concerns learning strategies. Visual-oriented learners, according to O'Malley et al. (1985), are likely to utilize imagery. Imagery relates new information to visual concepts in memory via familiarity, easily retrievable visualization, phrases, or locations. On the other side of the coin, auditory-oriented learners are prone to maximize the auditory representation. Retention of the sound or a similar sound for a word, phrase, or longer language sequence.

For one thing, internal factors affect learning outcome. For the other, external factors simultaneously affect or compliment learning outcome at a certain level. Learning exposure is a crucial context affecting the development of second language learning/ teaching (Yorio 1976; Spolsky 1988). Considered variables to benefit or hinder the outcome of second language learning, type of instruction, length of instruction, place of instruction, material of instruction, source of instruction are input to forecast the achievement in learning.

In an effort to pass on the utmost benefits to learners, an instructional media is created on the basis that learners can learn individually at their own pace. Learners may gain not only the content but also the learning strategies starting from what they ought to learn, how they ought to learn, to when they ought to learn it (Corder, 1974 cited in Prapphal, 1981). Learners' attitudes to teaching materials mean a lot to the ultimate success. In general, adult learners dislike having a course book imposed upon them in a rigid way. They prefer a variety of materials and the opportunity to use them in ways they choose themselves.

Besides, Jackendoff (1983:12 cited in Spolsky, 1989) pointed out that the brain processing is interactive and parallel. An attempt to construct knowledge is possible, and the use of an instructional media, especially via the computer is possible and will be effective if there is an attempt to apply the brain metaphor to computer design. Consequently, a branching design possesses a better preference and outcome than a linear one.

In conclusion, the present research aims at developing an instructional multimedia to enhance the ability in English pronunciation of different learning–style learners, and studies how the instrument affects the learning outcome of different learning- style learners. The practice activities are simultaneously put into the design to study if it results in and affect the learning outcomes.

1.2 Research objectives

1.2.1 To compare the learning achievements gained from different designs of multimedia pronunciation lessons of Thai and Chinese students

1.2.2 To compare the learning achievements gained from different design of multimedia pronunciation lessons between Thai and Chinese students

1.2.3 To compare the learning achievements of Thai and Chinese students who receive practice activities with that of those who do not.

1.2.4 To compare the learning achievements between Thai and Chinese students who receive practice activities with that of those who do not.

1.2.5 To compare the learning achievements of Thai and Chinese students who have different learning styles.

1.2.6 To compare the learning achievements between Thai and Chinese students who have different learning styles.

1.2.7 To identify factors that influence learning achievements of Thai and Chinese students.

1.2.8 To compare factors that influence learning achievements between Thai and Chinese students.

1.3 Null hypotheses

1.3.1 The learning achievements of Thai and Chinese students gained from different designs of multimedia pronunciation lessons are not significantly different.

1.3.2 The learning achievements gained from different designs of multimedia pronunciation lessons between Thai and Chinese are not significantly different.

1.3.3 The learning achievements gained on Thai and Chinese students who receive practice activities and that of those who do not receive the treatment are not significantly different.

1.3.4 The learning achievements gained between Thai and Chinese students who receive practice activities and that of those who do not receive the treatment are not significantly different.

1.3.5 The learning achievements gained on Thai and Chinese students with different learning styles are not significantly different.

1.3.6 The learning achievements gained between Thai and Chinese students with different learning styles are not significantly different.

1.3.7 There is an interaction between designs, practice activities, and learning styles on the learning achievement.

1.3.8 There is a significant difference between factors that influence learning achievement of Thai students and the factors that influence that of Chinese students.

1.4 Variables

1.4.1 Independent variables:

a) Multimedia Pronunciation lessons using drills with two different designs, ball queuing and color-bar queuing

b) Practice activities- 4 activities

c) Learning styles- visual, audio, tactile, and kinesthetic

1.4.2 Dependent variable:

English pronunciation achievement

1.5 Statement of Limitations

Since tactile preference learning styles are not common in Asian students (Reid, 1994), there were only few of them found in this study. However, the number of tactile learners found was not included in the statistical analysis because there were very few, and might cause an error in the statistical data analysis.

1.6 Conceptual framework

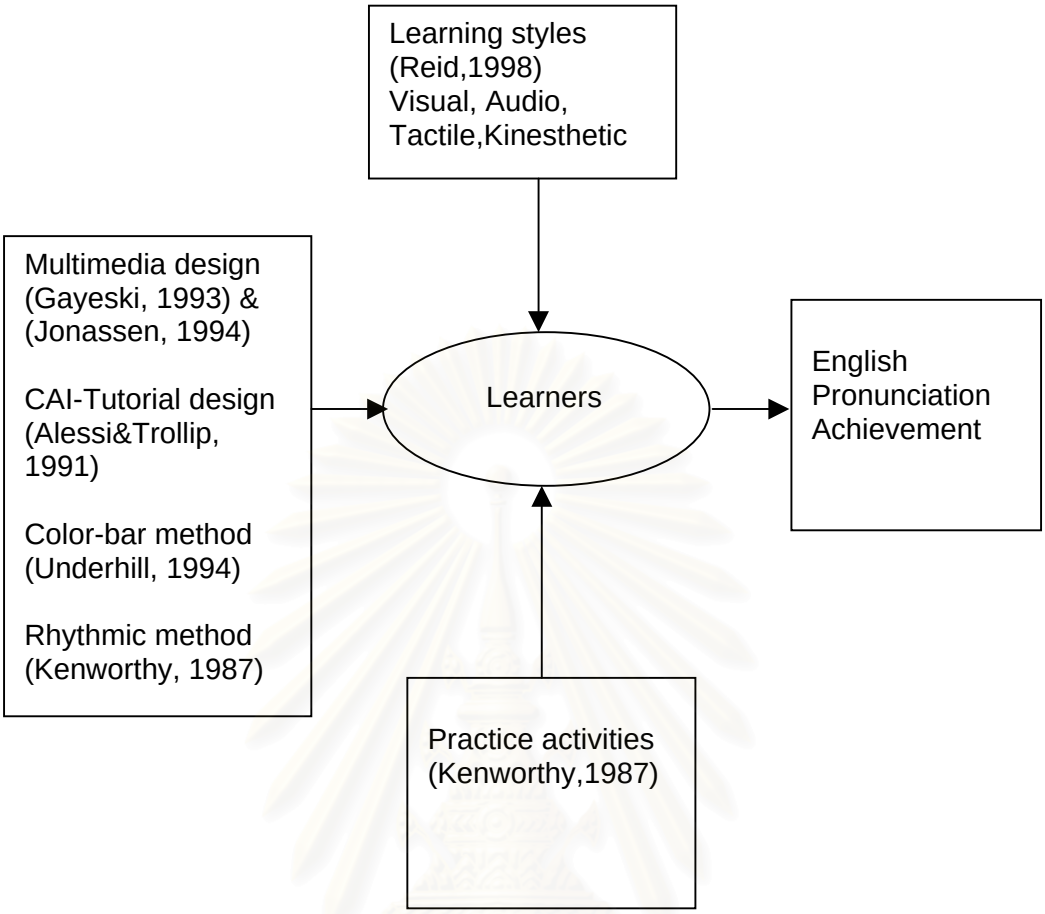


Figure 1.1 Conceptual framework

1.7 Subjects

Sixty two first-year Thai and forty first year Chinese undergraduate students who were non English majors and had never taken any courses in the English speaking countries. The subjects were randomly sampling into the study.

1.8 Duration

The duration of the study was 6 weeks of the second semester in the academic year 2002. The first week of the study was arranged for the course orientation, for the pretest, and for examining the learning styles of the subjects. From Week two to Week five, the multimedia pronunciation lessons were given alternately with practice activities. Last week of the study was arranged for the posttest .

1.9 Operational Definitions

Rhythmic methods:	Methods to teach word stresses using rhythm of different queuing to identify stressed and unstressed syllables
Ball queuing:	A type of rhythmic method using moving balls with different sizes and levels to teach word stresses in English
Color-bar queuing:	A type of rhythmic method using color bars with different dark red and light red color to teach word stresses in English
Multimedia:	A combination of more than one modality of information, text, pictures, moving balls, colorful bars, and sounds, which they were designed to show word stresses
Learning style:	A preferable that a subject uses to learn, obtain, summarize, and store what are intended to be taught in each lessons
Audio learning style:	A learning style which is characterized by a preference for listening to lectures and audio/cassette tapes
Visual learning style:	A learning style which is characterized by a preference for text, charts, drawings, and other graphic information
Tactile learning style:	A learning style which is characterized by a preference for moving and touching
Kinesthetic learning style:	A learning style which is characterized by a preference for practicing and a hand-on experience
Learning Exposure:	An environment that offers subjects an opportunity to practice pronouncing words that are selected from the multimedia lessons or words that fall in the same categories as taught in the multimedia lessons with an appropriate stress. There are four classroom practice activities included in this study.
Learning Achievement:	A posttest score measured by an oral pronunciation test. The achievement is considered a short-term retention test because it is given to the subjects one week after all the lessons were presented to the subjects. What is tested is what has already been covered in the lessons.

1.10 Expected outcomes

The expected outcomes of the study are to benefit the field of Education as follows:

1.10.1 As a guideline in developing an effective instructional multimedia to teaching English pronunciation for undergraduates.

1.10.2 As a guideline in assigning a more appropriate practice environment for the utmost benefits of the learners.

1.10.3 As a guideline in improving instruction and assignment in compatible with different learning styles.

1.10.4 The result of the study is the grounded theory for further study in using instructional multimedia for the pronunciation lessons serving learners with different learning styles.

CHAPTER 2
Review of the Literature

Technology in Education is designed to prepare and assist students to be knowledgeable in any fields of studies. Its application appears in many subjects, namely mathematics, sciences, and even the study of foreign language such as the study of English in Asian countries, including Thailand and China. The present study attempts to investigate the design of CAI multimedia program in teaching English pronunciation so that the students can be best benefit from the most suitable teaching method.

This chapter presents a review of the literature related to CAI and the multimedia programs that are used in teaching English to students with different learning styles. The first section explains the features and advantages of CAI multimedia program in education, the second section explains the study of pronunciation, particularly the word stresses, the third section explains the learning styles, and the fourth section explains the practice activities.

2.1 The features and advantages of multimedia programs in education

Alessi and Trollip (1991) stated that there were a variety of names calling instructional computer programs which are: CAI- computer-assisted instruction, CBE- computer-based education, CAL- computer-assisted learning, IAC- instructional applications of computers, and CBI- computer-based instruction. To be an effective tool assisting in instruction, a program should consists of the following four phases:

Presenting information
Guiding the student
Practicing by the student
Assessing student learning

The phase presentation is teacher centered. The second phase is more interactive and includes both the student and the teacher. The practice phase is student centered. The last phase helps students to be successful in their learning process. A test provides information about the level of learning, the quality of teaching, and future instruction needs.

There are five major types of programs existing in the current instruction and learning process which are tutorials, drills, simulations, games, and tests (Alessi and Trollip, 1991, Loahacharatsang 1998). Each type of program has its own advantages.

Tutorial lessons aim to satisfy that information is presented or skills are modeled and that the student is guided through initial use of the information or skills. A good tutorial should include both presentation and guidance, while extended practice and assessment are the domain of drills and practices. Tutorials are used in almost every subject area from the humanities to the social and physical sciences. They are appropriate for presenting factual information, for learning rules and principles, or for learning problem – solving strategies (Gagne, Wager & Rojas, 1981 cited in Alessi & Trollip, 1991:17).

Drills are not intended to teach. The function of drills is to provide practice, and they are applicable to all types of learning, especially to spelling or foreign language word translation. Drills should be presented after an initial presentation and guidance has occurred.

Simulations provide students actual performing activities to be learned in a context that is similar to the real world. A sample of a simulation is a flying lesson for pilot (Trollip, 1979 cited in Alessi & Trollip, 1991:132). The result of the instruction was very satisfying because the simulated airplane can be repositioned for each sequence of instruction, whereas a real airplane would have to fly to the appropriate starting position each time. This was effective in instruction and also cost effective.

Games provide an environment that facilitate learning or the acquisition of skills. Games involve some form of competition, and it should be challenging in which one has to accomplish to reach the goal. Besides, they are to have fantasy, safety, and entertainment to draw students' attention.

Tests corporate the two major ways. The first one is to incorporate computers in constructing the test and using the computer to administer the test. The characteristics of the test are to have purpose, objectives, length, item banking or item generation, size of item pool, questions, feedback, passing score, timing, data to be collected, and presentation of results.

Warschauer (1996) stated that a program assisted in language learning should carefully selected to match the objectives and content. The program and course content is to promote student centered. Some activities and lessons develop a student's problem-solving and decision-making abilities. Computer-assisted instruction is one of the approaches used to provide students with hands-on learning experiences in which they can demonstrate established learning outcomes (Jonassen, 1994).

2.2 Technology and English Education

There are many benefits found from integrating technology, especially computers into classrooms. Kaufmann (1992) points out that computers help to overcome the difficulties posed by a heterogeneous class with the provision of a readily available range of materials, diverse to their level of difficulty and subject area. Working with computers is seen as a prestigious activity since they can provide hypertext or hypermedia programs which involve or provoke students with different ways to get to the information they need. Each student can take his own time learning the way they prefer. Moreover, introducing computers is another way to motivate students with low levels of confidence and self-esteem to learn (Loria, 1995).

The ability of many computer programs to provide instant feedback further frees a teacher to spend time with larger number of students than would possible if the teacher is solely responsible for the correction of the work. Therefore, drills seem to be appropriate for teaching English pronunciation that to be able to master pronunciation in the second or foreign language, a student needs to do a lot of practices (Kenworthy, 1987).

Drills, in combination with tutorials and other methodologies, provide practice and are necessary for learning information in which fluency is required, such as basic math skills, foreign languages, spelling and English usage, and vocabulary (Alessi and Trollip, 1991).

Drills may be applied to simple paired-associate learning, such as spelling or foreign language word translation; to verbal information, such as definitions, historical facts, or scientific concepts and principles; to simple problem solving, such as arithmetic facts; and to complex problem solving, such as problems in the physical and social sciences.

Basic Procedure of Drills

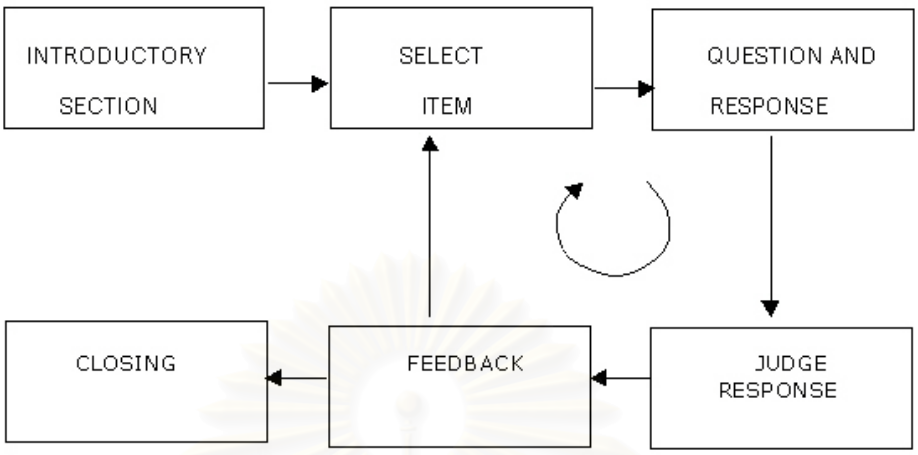


Figure 2.1 basic procedure of drills (Alessi and Trollip, 1991)

The program starts with a short title page which provides complete directions. Then, items for selection are displayed. Item presentations should be lean, have good layout, and use proper spelling, grammar, and punctuation. Students respond to questions or items given. Suggested forms of answers are single-word and/or numeric. The next step is to give feedback. Feedback should be short in case the response is correct, but in case the response is incorrect the feedback should be corrective and informative. Drill sessions should be terminated at about fifteen minutes and students should be kept informed of progress. Drills should also allow temporary termination at any time based on student request, and allow restarting. Help requests and requests to see the answer functions should be provided.

Advantages of computer-based drills (Alessi and Trollip,1991, Loahacharatsang 1998)

1. Computer – based drills can be made interesting through the use of graphics, informing the student of progress, and introducing variety. The use of interactive graphics can be used to increase the effectiveness of drills in ways not possible with workbooks or flashcards. The use of graphics as a prompt, as a context, as a motivator, and as feedback can serve to make computerized drills more effective than other types.

2. Computer – based drills can emphasize practice on difficult items, and they have great potential for increasing drill efficiency and effectiveness. These methods are practically impossible to implement using flashcards or workbooks. Students can practice over and over without the retired time. This too is difficult or impossible with non computerized drills.

3. Computer–based drills are very good at storing different types of data automatically and effortlessly. This permits better methods of item queuing, retirement, and drill termination. It also permits permanent records for the student, the teacher, and the author about student performance and item quality.

As time goes, the computer programs have been developed (Jonassen,1989). They use of hypertext, hypermedia, and multimedia has been introduced by Kommers (1996). Kommers (1996) defines media as the tools used to store, process, and communicate information. Media imply physical devices, formats about how to write and read the information exactly and not to forget the organizations around the media enabling users to function society. Furthermore, media provide interconnection property and integration. With collaborative usage, working or learning together on a new media or product design via interconnected computer systems becomes the de facto way, replacing solitary, isolated creations on separated work stations.

The media family, hypertext, hypermedia, and multimedia have already won the popularity in the learning and teaching environment. The properties of each are:

Hypertext is a method to create and access nonlinear text. Texts are small self-containing paragraphs. Essential words or groups of words in a paragraph refer to other paragraphs or to other words or groups of words in other paragraphs. The user is free to decide whether to create a link or not: any semantic relation or mental association may be an argument for defining or tracing a hyper link. After clicking on a highlighted term, the user jumps via the link and will immediately see the requested explanation.

There are two types of links:

1. From a hot spot to the header of another article that elaborates on the meaning and background of the launching hot spot.

2. From one hot spot to a hot spot in another article. This enables the reader to see a certain concept in another context.

Hypertexts possess some or all of the following characteristics (Jonassen, 1989):

1. nodes or chunks of information of varying sizes

2. associative links between the nodes that enable the user to travel from one node to another

3. a network of ideas formed by the link structure

4. an organizational structure that describes the network of ideas

5. the ability to represent explicitly the structure of information in the structure of the hypertext

6. dynamic control of information by the user; that is, a high level of inter-activity with the user, so the user decides where to go in the hypertext

7. multi-user access to the information—many hypertexts are available to many users simultaneously

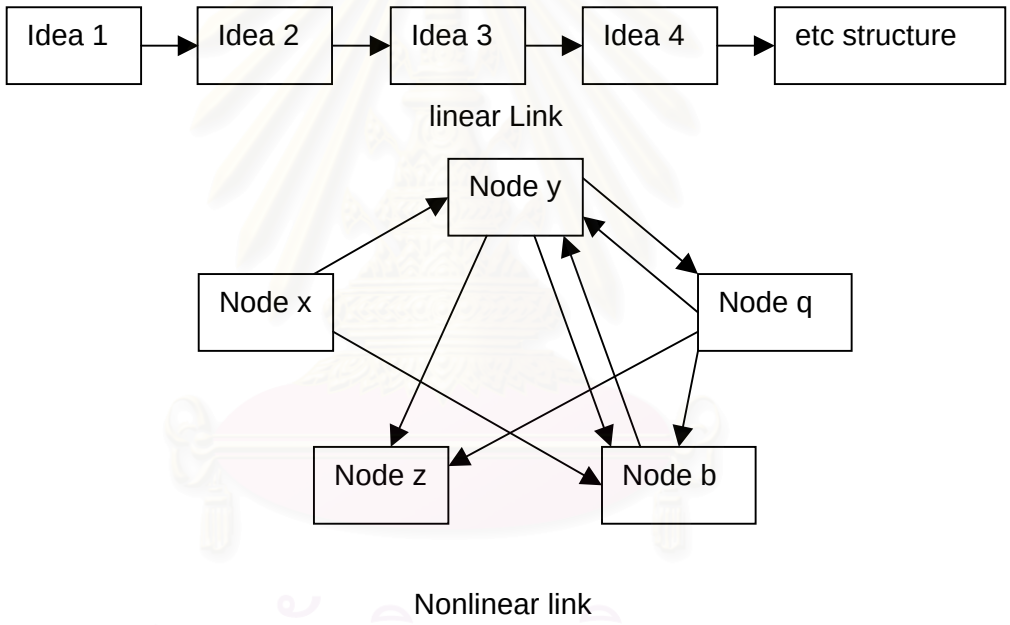


Figure 2.2 linear and nonlinear links

Hypertext systems permit users to determine the sequence in which to access information (browsing), to add to the information to make it more personally meaningful, or to build and structure their own knowledge base. Like most information systems, interaction is the most important attribute. Hypertext information systems afford interactivity by permitting more dynamic user control of the information in the knowledge base than do most other systems.

Hypertext, text, images, sound, and actions are linked together in nonsequential associations that let the user browse through related topics in any order. At the center of this system is linking. There is no document of bit of information that exists alone; each document contains links to other related documents. This interconnectivity of documents has no starting point or end, has no single set of authors, and is controlled by no single infrastructure. An example of hypertext is a computer glossary from which a user can select a word and retrieve its definition. This definition is linked to the beginning point and the user can move from it on to other related terms.

Hypermedia are nearly synonymous with hypertext*;* however, it emphasizes the contextual components of hypertext. Hypermedia uses the computer to input, manipulate, and output graphics, sound, text, and video in the presentation of ideas and information. When a teacher uses hypermedia, the computer directs the action of devices such as a video camera, videodisc player, CD-ROM player, tape recorder, VCR tape deck, scanner, video digitizer, audio digitizer, or musical keyboard (Sharp, 1996). The term “hypermedia” implicitly advocates how to access information elements and hot to crisscross in information space.

Warschauer (1996) explains that hypermedia provides a number of advantages for language learning. First of all, a more authentic learning environment is created, since listening is combined with seeing, just like in the real world. Secondly, skills are easily integrated, since the variety of media make it natural to combine reading, writing, speaking, and listening in a single activity. Third, students have great control over their own individual path, going forward and backwards to different parts of the program, honing in on particular aspects and skipping other aspects altogether. Finally, a major advantage of hypermedia is that it facilitates a principle focus on the content, without sacrificing a secondary focus on language learning form or learning strategies. For example, while the main lesson is in the foreground, students can have access to a variety of background links which will allow them rapid access to grammatical explanations or exercises, vocabulary glosses, pronunciation information, or questions or prompts which encourage them to adopt an appropriate learning strategy.

Multimedia are those computer-based applications that allow the user to see and hear different types of information via one screen with audio support. The combination of more than one modality of information-text, pictures, video, animation,

and sound fragments- on one screen with simultaneous control of one software application brings the user a bigger variety in information and realizes important elements for virtual reality.

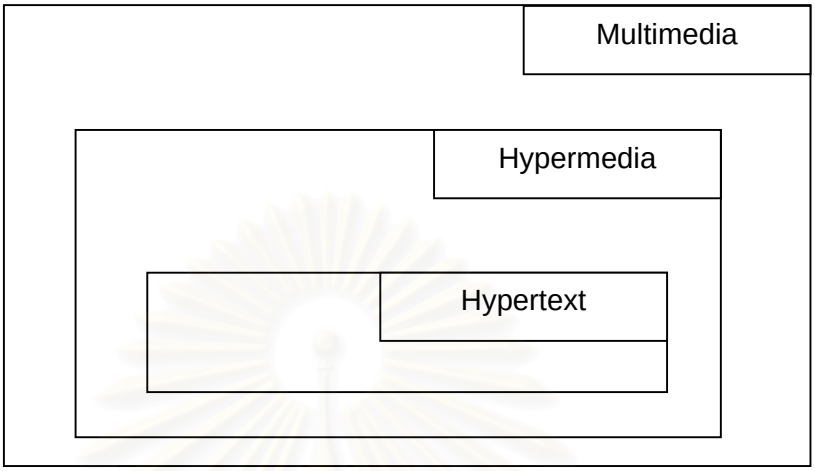


Figure 2.3 Family nesting of hypertext, hypermedia, and multimedia (Kommers,1996)

Thank to their attributes, hypertext, hypermedia, and multimedia are information resources whose data are in need in learning, thinking, and designing new ideas. Information is by product of human mental effort, but it also becomes more important as a strategic input for mental tasks. As Oscar Wilde (cited in Kommers, 1996) quoted that Education is an admirable thing. But it is well to remember from time to time that nothing that is worth knowing can be taught. Therefore, this is one of the most effective tools in facilitating teaching and learning process.

Lehrer (1993) has developed a very good framework for HyperComposition, consisting of four major processes:

1. Planning requires that students make decisions about
   - 1.1 major goals of the knowledge base (who is the audience, what they should learn)
   - 1.2 topics and content to be included in the knowledge base
   - 1.3 relationship among the topics (how they will be linked)
   - 1.4 interface design (what functions should be provided to the learner)
   - 1.5 how the designers will collaborate to complete the task

2. Accessing, transforming, and translating information into knowledge, including
    2.1 searching for and collecting relevant information
    2.2 selecting and interpreting information sources
    2.3 developing new interpretations and perspectives
    2.4 allocating information to nodes and deciding how it will be represented, that is, in which medium(text, graphics, pictures, video, audio)
    2.5 deciding on the nature of the links necessary to interconnect content and create links
3. Evaluating the knowledge base, including
    3.1 assessing compromises in what was represented and how
    3.2 assessing the information coverage and its organization
    3.3 testing the browser
    3.4 trying it out with users and soliciting their feedback
4. Revising the knowledge base from the feedback, including
    4.1 correcting content errors that may have been reported
    4.2 reorganizing and restructuring the knowledge base to make it more accessible or meaningful.

2.3 Related Researches

AL– Mekhlafe(1999) studied the relative effectiveness of two instructional media (CD–ROM and Videotape)as tools for learners to identify classroom strategies that facilitate content learning in English by students whose first language is not English. The subjects of the study were 48 students enrolling in ESL courses in a university in the southwest of the us. Results showed that CD – ROM users were able to identify more strategies than Videotape users ; however, there was not a difference between groups on perceived knowledge gain of ESL teaching strategies, attitude toward, or intention to use instructional media. An implication of the study is that interactive multimedia is more effective for learning new teaching strategies for teachers than the use of video for the same purpose.

Jung (1999) studied the use of an interactive multimedia courseware. She would determine if the use of an interactive multimedia courseware is helpful in improving students' attitudes toward learning English and their language development. Students placed in the experimental group were assigned to either a high or low cooperation and either a friend pairing or non friend pairing. There were one control group and 4 experimental groups.

Participants were given a pre-test and posttest ; the scores were to be used in both comparing their achievement. The analysis of the data indicated that the experimental group using the interactive multimedia courseware achieved higher scores than the control group on all four measures of language development. The result also spelled out that there were strong functional relationships between interaction features and scores of attitude, vocabulary, listening and oral proficiency so that children's language development can be predicted from interaction features they showed in class. This result might be an answer to why the experimental group scored higher than the control group on all measures of attitude and language development. This study suggests that the cooperative computer-assisted language learning is an effective alternative to traditional teaching and learning English.

Crooks, Klein, Savenye & leader (1998) study different types of learner control that are worth given to learners and are recommended in computer-based instruction design by Lopez&Harper, 1989; Pollck&Sullivan, 1990; and Igoe, 1993. This is so because various learner-controlled modes offer opportunities and flexibility for students in accessing the given information at their own freewill and learning pace. There are basically tow major types of learner control: the control of content and the control of program.

The control of content can be designed in two approaches. The first one Ss the lean-plus by which learners receive a basic CBI program and are given the option of requesting additional instruction, Whereas, the other-the full-minus gives a full instructional program and offers the option of bypassing instruction.

The control of program is primarily referred to the flexibility that learners are allowed to navigate program at their own pace by using a mouse tool to select options on the computer screen including examples, practice items, summary material, review material, and practice tests as they need.

Though, they are not allowed to go backward or skip around within the program since it is linear, the learners are able to skip particular optional elements or to discontinue a practice session by selection the appropriate button. The findings of the experiment are that 1) no achievement effect has been yielded by the different approaches of learner control. One factor is that the design provides a high degree of instructional support. The students in all treatment conditions have several

opportunities to view materials as required. Other researchers have also found that well-designed instructional materials often result in no significant achievement differences (Clark, 1994). The students in the full-minus condition spend significantly more time on practice than those in the other do; however, time on task does not influence the learning achievement. 2) The learners demonstrate positive attitude toward the program due to is flexibility, in providing the learners with the navigate program, whereas, a conventional classroom cannot. This concept promotes learners as individuals. Considered an effective option, yet yielding no significant difference on learning achievement, learner-controlled modes are recommended in CBI design (Igoe, 1993).

Hughes (1993) explored whether multimedia technology facilitated the acquisition of a certain set of Spanish lexical items. The research used a four-group experimental design. Students of Spanish at the University of Pennsylvania were randomly assigned to one of three different treatment groups or to a no-treatment control group. All experimental participants were given a pretest and posttest. The multimedia treatment group viewed segments of popular Spanish-language films using computer-controlled videodisc technology. The V 1 and V 2 groups viewed the same Spanish-language film segments on a television monitor. The V 2 group viewed an version with English-language subtitles while the V 1 group viewed the original Spanish-language version. The pre-treatment and post-treatment cloze tests measured vocabulary knowledge. The scores on these tests were utilized as outcome measures. The increase in cloze-test scores for the multimedia, V 1 and V 2 groups supports the notion that context-based vocabulary instruction is an effective method for teaching vocabulary. The marginally higher scores of the multimedia group subjects indicate that this technology, if used properly, can assist in the teaching of Spanish vocabulary.

2.4 History of Pronunciation Instruction in ESL Classrooms

Morley (1991) described that changing perspectives on language learning and language teaching have led to a variety of principles and practices of pronunciation work. During the prosperous era of the Grammar-Translation and Reading-Based approaches, pronunciation was viewed as irrelevant to language instruction (Celce-Murcia, 1987). Furthermore, Celce-Murcia (1996) explained that one of the major characteristics of the Grammar-Translation and Reading-Based

approaches is that pronunciation is given little or no attention in the classroom. The researchers stated that the former approach focused on grammatical rules, reading difficult texts, and translating disconnected sentences from the target language into the mother tongue. As for the latter approach, one of the main objectives was reading ability. Also, translation was an important classroom procedure. During the Direct Method and Audio-lingual periods, however, pronunciation accuracy was very important and was considered as a high-priority goal. Instruction emphasized articulatory explanations, imitation, and visual aids (Celce-Murcia, 1987). Primary attention was given to the teaching of phonemes, phonetic rules, stress, rhythm, and intonation (Morley, 1991; Celce-Murcia, 1987).

However, the interest in pronunciation practice dropped considerable from the late 1960's to the 1980's. New pedagogical views aimed at language functions, communicative competence, task-based methodologies, and authenticity in learning activities and materials. As a result, the pronunciation process from the previous period was regarded as a meaningless, non communicative, and unmotivating activity. There was little transfer from drilling practice to natural communication (Celce-Murcia, 1987).

Also, several questions were raised about pronunciation in the ESL classroom. The questions were about, for instance, whether or not it could be taught or learned at all since accomplishment of native-like pronunciation seemed impossible (Scovel, 1969 cited in Morley, 1991).

From the mid-1980's to the present day, "there has been a growing interest in revisiting the pronunciation component of the ESL curriculum for adults and young adults" (Morley, 1991). The increasing amount of research and the increasing number of teacher resource books focusing on pronunciation have reflected renewed interest in this area. The attention concentrated on this area may be the result of the introduction of more varied instruction measures which focus on heightening the learning and teaching of the speech/pronunciation component of oral communication (Morley, 1996).

2.5 The Importance of Teaching English Rhythm and Intonation

Several researchers have emphasized the importance of teaching rhythm and intonation to second language learners. Wong (1987) indicated that native

speakers of English rely on rhythm and intonation to process speech. These two components not only “provide structure, but they also direct the listener to the centers of attention in the stream of speech”.

Moreover, Gilbert (1982) remarked that when students are not aware of how English intonation work, they will confuse the native listener unintentionally and this ignorance also caused the nonnative learners to miss important signals when listening to spoken English.

An example from the work of Tiffen (1992) illustrated that incorrect rhythmic/stress errors were the major cause of intelligibility failure of Nigerian English. The author noted the participants stressed to many syllables in the utterances or left the normally stressed words unstressed. The former pattern led to “a staccato-like rhythm” while the latter resulted in complete misunderstanding by the listener. Further, Gilbert (1993) investigated the contribution of the temporal patterning of speech to the reduced intelligibility of foreign-accented utterances. The Chinese speaker’s productions were temporally modified so that the duration of acoustic segment matched the duration of corresponding segments produced by native English speakers. In contrast, the native productions were temporally distorted to match the durational patterns of the Chinese-accented productions. Afterwards, intelligibility was measured by native speakers after they listened to the stimuli. The results showed that intelligibility of the modified Chinese productions improved significantly after temporal correction. In contrast, native performance declined significantly after temporal distortion according to the Chinese speaker’s timing. Thus, the findings implicated that accurate temporal structure in speech is a significant factor in improving intelligibility.

Another commonly held belief is that pronunciation teaching is to teach students to pronounce discrete sounds accurately (Wong, 1987 cited in Brown 1994). Therefore, most pronunciation instruction materials have emphasized teaching individually phonemes (consonants and vowels) rather than intonation. She, then, suggested that in pronunciation instruction, English sounds should be treated within the framework of rhythm and intonation. This is because second language learners do not have to make a transition from learning individual sounds in isolation to learning the sounds in the stream of speech.

Regarding the learners themselves, Gilbert (1993) noted that one reason that second language learners do not pay much attention to intonation in native speaker's and their own speech is the learners do not hear intonation very well. When listening to speech, they put a lot of effort in understanding strange sounds, word meaning, and difficult grammar. As a result, Gilbert stated that they concentrate less on the "music" of the language even though much information about grammar and attitude is carried through intonation.

The following factors are presented and discussed in detail: learners' first language, affective variable, and age. (Clennell, 1997)

1. Learners' First Language

Several studies have found that interference from learners' first language plays and important role in rhythm and intonation acquisition. First of all, the mother tongue interferes in the perception of the two structures. For instance, Watanabe (1988) investigated English sentence stress perception by Japanese students. The participants, 27 Australian students (a Control group) and 120 Japanese students, were asked to listen to 25 sentences and identify the intonational nucleus in the utterances. The results demonstrated that the Japanese participants were less successful than the native speakers in choosing the correct sentence stress in utterances which the Fo (fundamental frequency) difference between the highest and the second highest syllable was less than 70 Hz. However, in the utterances with a Fo difference more than 70 Hz, the Japanese students' perception was identical as that of the native speakers. As a result, the researcher concluded that the Japanese speakers seemed to rely on high pitch rather than duration, intensity, or pitch movement for stress perception judgment.

Moreover, the learners' native language has an effect on rhythm and intonation production. The participants, 5 Americans, 5 proficient Japanese speakers of English, and 5 non-proficient Japanese speakers of English, were asked to read four sets of English sentences at a comfortable speaking rate. The sentences in each set had different number of the nominally unstressed syllables that intervened between a target stressed syllable and the next stressed syllable. The utterances were recorded and analyzed in terms of the duration of the target stressed vowels and the duration of the target interstress interval. The experiment demonstrated that the difference between the production of the native speakers of English and the nonproficient nonnative speakers was statistically significant. The Americans and the

proficient Japanese speakers compressed the stressed vowels when unstressed syllables were added. The nonproficient Japanese speakers, in contrast, showed very little foot-level shortening.

2. Affective variables

One of the predictors of pronunciation accuracy, several researchers claim, is concerned with the learners' affective variables such as attitude, motivation, and inhibition. For example, the factors that may predict pronunciation ability. They indicated that besides learners' native language, aptitude for oral mimicry, and the length of residency in an English environment, strength of concern for pronunciation accuracy accounts for how well second language learners pronounce English. In addition, some researchers claim that the reason that children seem to be more successful than adults in learning second language pronunciation may result from their motivation to achieve native-like skill. Clennell (1997) suggested that children may be better than adults at foreign language pronunciation because of the stronger pressure from their peers to pronounce L2 sounds without an accent. The motivation is a significant factor which leads younger learners to master foreign sound system. They noticed that the younger participants appeared to "continue their period of active acquisition longer, so that they eventually surpassed the older subjects". The researcher further explained that the integrative motive or the desire to be indistinguishable from native speakers may have influenced the younger learners to achieve the better control of second language phonology. On the other hand, adults have less peer pressure than children, and they may fear of losing their cultural-personal identities; as a result, they are less motivated to perfect their pronunciation skill.

3. Age

It is broadly accepted that children are better than adults at acquiring second languages. This assumption has derived from the notion of Critical Period Hypothesis (CPH) proposed by Lenneberg (1967). The hypothesis claims that "primary language acquisition must occur during a critical period which ends at about the age of puberty with the establishment of cerebral lateralization of function" Also, Patkowski (1982) mentioned that the term "critical period" refers that the age limitation is absolute; in theory, first language acquisition is not possible after the critical period point.

Initially, the CPH was concerned only with first language acquisition. Later, the hypothesis was applied to second language contexts (Brown, 1993) As a result, it seems impossible for adults to achieve native like pronunciation in second languages.

According to Kenworthy's study (1987), the factors that affected pronunciation Learning are as follows:

1. Native language

Clearly, the native language will be the most influential factor affecting a learner's pronunciation. Many L1 – L2 carryovers can be overcome through a focused awareness and effort on the learner's part.

2. Age

Generally speaking, children under the age of puberty stand an excellent chance of "sounding like a native" if they have continued exposure in authentic contexts. Beyond the age of puberty, while adults will almost surely maintain a "foreign accent," there seems to be no particular advantage attributed to age.

3.Exposure

It is difficult to define exposure. Researchers support the notion that the quality and intensity of exposure is more important than the mere length of time. If the class time spent focusing on pronunciation demands the full attention and interest of your students, then they stand a good chance of reaching their goals.

4.Innate phonetic ability

Often referred to as having an "ear" for language, some people manifest a phonetic coding ability that others do not. Learner strategy training, however, has proven that some elements of learning are a matter of an awareness of your own limitations combined with a conscious focus on doing something to compensate for those limitations. Therefore, if the pronunciation seems to be naturally difficult for some students, they should not despair : with some effort and concentration, they can improve their competence.

5. Identity and language ego

Learners need to be reminded of the importance of positive attitudes toward the people who speak the language, but more importantly, students need to become aware of and not afraid of the second identity that may be emerging within them.

6. Motivation and concern for good pronunciation

Some learners are not particularly concerned about their pronunciation while others are. If that motivation and concern is high, then the necessary effort will be expended in pursuit of goals.

All six of the above factors suggest the any learner who really wants to can learn to pronounce English clearly and comprehensibly

Views on teaching pronunciation have changed dramatically over the last half-century of language teaching. Language was viewed as a hierarchy of related structures and at the base of this hierarchy was the articulation of phonemes and their contrasts within English and between English and native languages. Pronunciation classes consisted of imitation drills, memorization of patterns, minimal pair exercises, and explanations of articulator phonetics.

In the 1970s, explicit pedagogical focus on anything that smacked of linguistic nuts and bolts was under siege by proponents of the various non-directives. “let-it-just-happen” approaches to language teaching. As we became more concerned with authenticity, real-world tasks, naturalness, non-directive teaching, and process, we became less concerned with the product : language itself. Pronunciation instruction became somewhat incidental to a course of study. It was not ignored entirely, but in the interest of promoting fluency-based instruction, accuracy-based focus on English phonology became, for many, an afterthought (Brown, 1994).

By the mid 1980s. With greater attention to grammatical structures as important elements in discourse, to a balance between fluency and accuracy, and to the explicit specification of pedagogical tasks that a learner should accomplish, it became clear that pronunciation was a key to gaining full communicative competence.

The current approach to pronunciation starkly contrasts with the early approaches. Rather than attempting only to build a learner's articulatory competence from the bottom up, and simply as the mastery of a list of phonemes and allophones, a top-down approach is taken in which the most relevant features of pronunciation stress, rhythm, and intonation are given high priority.

Rita Wong (1987 : 21) cited in Brown (1994) reminds us contemporary views [of language] hold that the sounds of language is less crucial for understanding than the way they are organized. The rhythm and intonation of English are two major organizing structures that native speakers rely on to process speech. ...Because of their major roles in communication, rhythm and intonation merit greater priority in the teaching program than attention to individual sounds.

Wong's comments reflect an approach that puts all aspects of English pronunciation into the perspective of a communicative, interactive, whole-language view of human speech.

An Overview of Second Language Learning and Teaching in 20th Century in America (Kaplan, 2000)

Table 2.1 Second Language Learning and Teaching in 20th Century in America (Kaplan, 2000)

Models of Language Variation
1. Meaning is the focus of language study
2. Semantics, sociolinguists, psycholinguistics and anthro-linguistic research abounds
3. Interest in intercultural communication research
4. Uses of language is central to the study of language
5. Performance is seen as more important than competence
Computational/Corpus Linguistics
6. Use of real language corpus linguistics collocations, concordances in language research

Table 2.1 (Continue) second Language Learning and Teaching in 20th Century in America (Kaplan, 2000)

Individual Differences Research
1. Emphasis is on learning styles, personality variables, attitude and aptitude
2. Culture is seen as central
Learning Strategies Research
3. Emphasis is on strategies and learner autonomy
Research on the Instructional Conversation and Language Assistance
4. Conversation is viewed as instructional
5. Learners are given lots of assistance and in-put/feedback which helps them to communicate
Instructional Technology
6. Interactive computer technology has a place in language learning
7. The CD-ROM format is effective in language learning

From the perspective of globalization and the influx of information technology, English language teaching and learning are emphasized as reflected by the 1996 curriculum. It is therefore crucial that the development of syllabi and selection or construction of English course books be congruent with the new curriculum as well as effective in terms of students' stages of language development.

Curricular and instruction depends on the following:

1. Learner variables which include stages and factors in language development, needs, interests, cognitive and affective predisposition, and expectations ;
2. social variables which include trends, appropriate, acceptance, demands, contacts, situations, contextual and cultural functions of language use ;
3. teacher variables which include training, awareness, language skills, competencies and managerial abilities ;
4. methodological variables which include tasks, practice assignments and presentations, assessment-evaluation-feedback, teacher roles, student roles and classroom culture;

5. materials and media which include relevancy, concepts, language functions, language forms, story lines, pragmatically, specific English – general English continuum, clarity, immediacy, applicability, and variety. It is thus necessary that languages educators, textbooks.

As for teaching English as a foreign language in Thailand, In the finding, Wongsothorn (1999) pointed out that at lower secondary level, students possess prominent oral skills compared to literacy which includes grammar and vocabulary. Oral skills are grouped with sound discrimination, stresses, and speaking component. At upper secondary level, the outstanding outcomes of students turns to literacy rather than oral skills. At this stage, Thai students learn the rules of language through speaking and listening better while their vocabulary building is done more effectively in reading and writing.

To support given information , students at upper secondary level aim at taking and passing the university entrance examination, and the test of which is based on grammar, vocabulary, reading, and writing skills. Most students, therefore, neglect the oral parts. At the higher education level: university level, literacy is more prominent compared to oral skills at the ratio of 2 : 1. This is somewhat meaningful to say that major direction of the curriculum is geared towards academic and professional purposes in literacy. However, being part of a globalization, oral skills should play active role in part of the curriculum. The needs for oral skills should be scrutinized from the perspective of individual needs, wants, and social use.

As for the English curriculum of the university level in general, literacy seems to be put a greater emphasis on than oral skills with in 3-5 tiers of Foundation English or basic English courses, English for academic or specific purposes, advanced, professional, and technical English courses.

Anderson and Ausubel (1965:8 cited in Brown, 1994) stated that meaning was a clearly articulated and precisely differentiated conscious experience that emerges when potentially meaningful signs, symbols, concepts, or propositions were related to incorporated with in a given individual’s cognitive structure on a non arbitrary and substantive basis.

Any learning can be meaningful if (1) learners have a meaningful learning setting- that is, a disposition to relate the new learning task to what they already known; and (2) the learning task itself is potentially meaningful to the learners- that is, relatable to the learners' structure of knowledge. However, the capability of human beings should be considered. Miller (1956) made an examination showing that human beings are capable of learning almost any given item within the so-called " magic seven, plus or minus two" units. We can remember an unfamiliar phone number, for example, long enough to dial the number, after which point it is usually extinguished by interfering factors. Things or items are more efficiently retained when they bear some meaningful relationship to the reality of physical images, directions, streets, and the rest of the town, and are therefore more suitable for long- term retention without concerted reinforcement.

Underhill (1994) presented methods in teaching pronunciation Integrating the chart; there are seven modes of chart usage

Table 2.2 methods to teach pronunciation (Underhill, 1994)

Mode	First move	Second move
1.Sounds are introduced and attached to the chart	Teacher gives model and learners try it	Teacher points
2. Teacher use the chart to prompt learners to speak	Teacher points	Learner speaks
3. Learner use the chart to point to what teacher has said	Teacher speaks	Learner points
4.Learners use the chart to prompt teacher to speak	Learner points	Teacher speaks
5.Teacher uses the chart to point to what learner have said	Learner speaks	Teacher points
6.Learners use the chart to prompt other learners to speak	Learner points	Learner speaks
7. Learners use the chart to point to what other learners have said	Learner speaks	Learner points

1. Manipulating diagrams

A simplified mouth diagram help learners become more conscious of their speech organs and can be used to illustrate some key features of vowels and consonants.

2. Learning a rhyme with rhythms from recitation

2.1 Recite a short rhyme once or twice and invite students to be alert.

2.2 After reciting it naturally but with clearly emphasized rhythm, recite each line again, leaving the last stressed word for the learners to provide. Usually there are several learners able to provide the word.

2.3 If the students get stuck at any point, just provide the words by pointing it out on the chart.

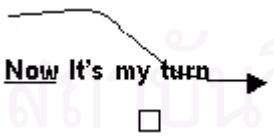
2.4 Pay attention to rhythm, speed, smooth linking, length of stresses syllables and reduction of unstressed syllables.

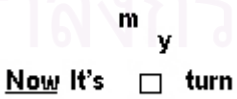
2.5 In a very short time, they will have learned the rhythm as a whole, not through repetition as such, but through the alertness required in sharp listening and attention to all the facets of making it " sound English".

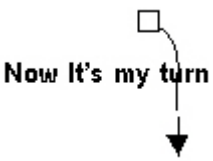
3. Using signs and symbols to represent intonation

3.1 Simple arrows before the tone unit, in which case you need to identify the tonic syllable on which the main part of the pitch movement will take place.

3.2 Pitch lines through the words Three samples are given as following







2.6 Related researches

Bell (1981) studied a multimedia program for enhancing language skills, including reading and speaking abilities under the dissertation titled " MUSIC, COLOR, AND LANGUAGE". The dissertation examined the creation, implementation, and testing of music and color components in the areas of reading, foreign language teaching, and special education. The study systematically incorporated multiple sensory input-lyric music materials such as melody, lyrics, rhythm, rhyme and color coding techniques. There were one control group taught by traditional techniques and methods described in Job Corps Guidebook for ESL and two comparison experimental groups taught by a multimedia program with different stimuli: the prearranged music components and the color coding of phonemes consecutively. All groups were administered a pre-test, in which identical typewritten material. At the end of the experiment, participants were all given a post-test to compare the outcomes. The finding of the study was that music materials and color coding of phonemes could be incorporated into the language acquisition and production process of ESL with favorable results. Moreover, the discussion suggested that both lyrical music and sound-phonics systems are recommended to enhance both passive and active language skills.

Wilson (1998) studied how certain visualization and timing techniques, commonly employed in computer assisted instruction, affected student achievement. Participants were 200 undergraduate college students who were delivered the lessons via computer-driven multimedia. The lessons were sequentially organized according to the educational objectives. Four visual treatments - static, graphic reveal, animation, combined graphic reveal and animation – were tested against two timing strategies–student–paced and program–paced–in a 4 x 2 mixed factorial design. The results revealed that there were no significant differences in achievement between and among the four visual treatments. In the timing treatments, however, scores for the student-paced treatment were significantly higher than for the program-paced version. However, there was no interaction found between the visual and timing strategies. Besides, conclusion drawn from the study suggested that, in light of the high cost for developing animated visuals, static visuals possibly provided a more cost-effective approach for more sophisticated learners, including college-level student populations, especially for instruction that focuses on cognitive learning objectives.

Ricci (1998) examined the influence of different media presentations on children's comprehension and memory of a story. Participants were presented a well-structured story either by audio, audio-visual, or interactive CD-ROM media. Within the interactive CD-ROM condition, participants either participated or observed. The interactive CD-ROM contained a wide variety of animations and sound effects that were considered mostly irrelevant to the story content. At the end, all participants were giver a memory and comprehension interview containing a free recall question, specific factual and inference questions. Results indicated no difference among the media conditions in terms of children's free recall of the story. However, participants put in who were audio oriented performed significantly better on the inference than factual questions. Participants who were put in audio-visual and interactive CD-ROM performed significantly better than those of the audio, even when the questions were based on information that was contained in the narration. The results also stated that the irrelevant objects included in the interactive CD-ROM did not distract participants from comprehending the story.

2.7 The Language Learning Style

Language learners' learning styles is regarded as a distinctive factor of learning iterating among learners. There are a lot of educators and researchers who are interested in the (learners) learning style of English as a second and a foreign language. Wassanasomsit (2000) compiled a variety of definitions of the term, as follows :

1. Learning style consists of different behaviors as indicators of how a person learns from the environment and reacts to it.

2. Learning style is a cognitive and interactional form which affects a learner's perception, memory and thinking process.

3. Learning style is a general method that a learner uses to learn different subjects and a second language.

4. Learning style is a natural process, a habit and a favorite way of each man to obtain, summarize and store new information and skills without thinking of either teaching strategies or contents.

A dimension of learning style- one that is very salient in formal classroom setting is the preference that learners show toward either visual or auditory input Brown, 1994). Visual learners tend to prefer reading and studying charts, drawings, and other graphic information; whereas, an auditory style is characterized by a preference for listening to lectures and audiotapes.

Jackendoff (1983) presented a claim that there must be levels of mental representation at which information conveyed by language is compatible with information from other peripheral systems such as vision, nonverbal audition, smell, kinesthesia, and so forth. If there were no such levels, it would be impossible to use language to report sensory input.

The conceptual structure hypothesis is that there is a single level of mental representation, conceptual structure, at which linguistic, sensory, and motor information are compatible.

2.8 Learning Exposure and Practice Activities

Learning Exposure refers to the opportunity for practice of the newly learned skills, or practice to maintain old ones. Tessa (2001) ensured that practices could be done in several ways, such as individual words, word groups, patterns within sentences or texts and talks. However, practice activities need to be variable so that the students could encounter it in any following manners: in mini-contexts such as lists, in short constructed spoken or written texts, in elaborated or supported texts, and in a variety of channels such as radio, peer talk, and films.

Cook (1985) cited in Spolsky(1986) that there are ways in which the language faculty and the other cognitive faculties are related. Just as language development is tied to physical development in specific ways; for instance, there is need for exposure to the language. It is now clear that there are a variety of the exposure and its amount that influence language development.

Both the quality and quantity of exposure mean a great deal to the end product of language learning achievement, learning a language involves an opportunity for the learner to match his or her own knowledge with that of native speakers or other targets. Furthermore, the more time spent learning aspect of a second language, the more will be learned.

Apparently, there is a wide discussion about types of exposure. An obvious difference found between the young child and the adolescent or adult is the ability of the latter to comprehend language as formal system.

According to drill input condition stated in Johnson (1986) cited in Spolsky (1989), the learner is expected to learn; therefore ample practice is given to develop automatic control. With no practices , learning is likely to be haphazard and uneven; with it, there can be systematic development of fluency and accuracy. The opportunity to practice new items means that learning a language involves an opportunity for the new skills to be practiced; the result is fluency.

There is an argument that practice does not necessarily make perfect in all cases, especially when the learners learn the other language when they pass puberty period. The first language influences a great deal in their second one. However, with the explanation about the meta-awareness, Rosansky (1975) cited in Ellis (1986) that adults, anyhow, will acquire primary levels more rapidly because of their greater cognitive abilities. The exception to this will be pronunciation, because of the difficulty of consciously manipulating this aspect of language. Children will prove the more successful learners, particularly when pronunciation is concerned, because they are strongly motivated to become part of the first language community and require a native-like accent to achieve this. It can also be predicted that they will achieve greater overall communicative fluency, both because they are likely to receive more years' exposure to the L2, and because of the importance of this aspect of proficiency in group interaction.

The study on "Fostering Second Language Development in Children" of ERIC clearinghouse on Language and Linguistics proved that language flourishes best in language –rich environment. In particular, children should be encouraged to practice English as much as possible and provide reinforcement by expanding on the children's vocabulary repertoire and by speaking coherently. It is essential that each learner have a chance to interact with others in the classroom or expose to the English working language environment as much as possible.

Panseetong (1997) developed practice packages for certain English words'vowel and consonant pronunciations. The target of these packages was grade 6 students. These students had problems producing the English vowel and consonant sounds which do not exist in the Thai language phonological inventory. The practice packages were constructed for use by a teacher or tutor in individually directed student practice sessions to correct misarticulating of an individual student. Each package was produced to provide 3 hours of practice and consisted of 1) a teacher's manual, 2) a work – pronunciation achievement test, 3) pronunciation exercises, 4) visual and audio pronunciation aides. The results showed the each package helped the students to correct their pronunciation problems. The average student's score on each of the eight word pronunciation achievement tests was significantly higher following the use of the practice packages at the level 0.05.

CHAPTER 3
Research Methodology

The research title “Effects of rhythmic methods in multimedia lessons and learning exposure upon English pronunciation achievement of Thai and Chinese undergraduates with different learning styles” was designed as experimental research.

The objectives of this research were to compare the learning achievement gained from different designs of multimedia pronunciation lessons of Thai and Chinese students, to compare the learning achievement gained from different design of multimedia pronunciation lessons between Thai and Chinese students, to compare the learning achievement of Thai and Chinese students who receive practice activities with that of those who do not, to compare the learning achievement between Thai and Chinese students who receive practice activities with that of those who do not, to compare the learning achievement of Thai and Chinese students who have different learning styles, to compare the learning achievement between Thai and Chinese students who have different learning styles, to identify factors that influence learning achievement of Thai and Chinese students, to compare factors that influence learning achievement between Thai and Chinese students.

This chapter describes the research method utilized and the procedure of this study. Five major areas covered in this chapter are:

a) subjects
b) research design
c) research instrumentation
d) research procedures
e) data analysis

3.1 SUBJECTS

The subjects were first-year Thai and Chinese undergraduate students who were non English majors and had never taken any courses in the English speaking countries.

The Thai subjects were 62 first-year undergraduate students of Chulalongkorn University. They majored in Science and enrolled in the Foundation English II course which was provided by Chulalongkorn University Language Institute at Chulalongkorn University. They all took Foundation English I which was compulsory in the first semester of this academic year. They were first selected for the research by simple random sampling, and then divided into two groups by matched-pair distribution using the pretest scores. The average score of the first group was 7.29, and the average score of the second group was 7.84 which were not significantly different in statistics.

The Chinese subjects were first-year undergraduate students of Guangxi Normal University in Guilin, China. They majored in physics, and during this semester they enrolled in the basic listening course which was provided by the college of teacher's education. Before taking this course, every student had taken the same English foundation course for first year students during the previous semester. They were first selected for the research by a purposive sampling, and then divided into two groups by matched-pair distribution using the pretest scores. The average score of the first group was 6.73, and the average score of the second group was 7.24 which were not significantly different in statistics.

Table 3.1 Number of subjects in the study

Group	Two different designs of pronunciation lessons	
	Rhythmic method	Color bars
Thai students	31	31
Chinese students	20	20

3.2 RESEARCH DESIGN

The research design used in the present study was an experimental design in which the pretest-posttest randomized design (Campell and Stanley, 1968) was applied.

Table 3.2 Experimental design

Thai subjects

R	O_1	X_1	Y_1	O_2
R	O_1	X_1	-	O_2
R	O_3	X_2	Y_1	O_4
R	O_3	X_2	-	O_4

Chinese subjects

R	O_5	X_1	Y_1	O_6
R	O_5	X_1	-	O_6
R	O_7	X_2	Y_1	O_7
R	O_7	X_2	-	O_7

R	=	random assignment
X_1	=	multimedia lessons with rhythmic method
X_2	=	multimedia lessons with color bars
Y_1	=	practices
O_1 O_3 O_5 O_7	=	pretest scores of each group
O_2 O_4 O_6 O_8	=	posttest scores of each group

3.3 RESEARCH INSTRUMENTATION

The instruments in the study consisted of CAI multimedia pronunciation lessons using drills, the perceptual learning styles preferences (PLSP) survey, pretest and posttest, and pronunciation practice activities.

1. Multimedia pronunciation lessons

The multimedia pronunciation lessons used in this experiment were developed from the theory and basic model of drills (Alessi and Trollip, 1991). Basic drill procedure begins with an introductory section, followed by a cycle which is repeated many times. The structure and flow of a drill is that an item is selected, the item is displayed, then the subject responds, the program judges the response, and finally the subjects receives feedback about the response. All of which were composed of nodes with linear and non-linear links. Learner control program is also incorporated.

The designs included rhythmic balls and color bars, considering as different types of teaching methods which were considered as one of the independent variables studied in this research. The rhythmic–ball pronunciation lessons were developed from the theory of pronunciation teaching method of Kenworthy (1987) that English was a rhythmic language. It has its own movement, including word stresses and sentence stresses. Kenworthy put different sizes of balls over stressed and unstressed syllables. Therefore, in this version it appeared that the rhythmic balls moved up and down. The balls also appeared bigger over the stress syllables, while the balls appeared small over the unstressed syllables. The color-bar multimedia lessons were based on one of a teaching pronunciation method done by Underhill (1994). The use of color bars was applied to show the stressed and unstressed syllables. Dark red bars were used to identify the stressed syllables while light red bars were used to identify the unstressed syllables. The rhythmic treatment and the color treatment basically enhanced the ability to identify sounds and stresses.

1.1 Planning and developing procedures

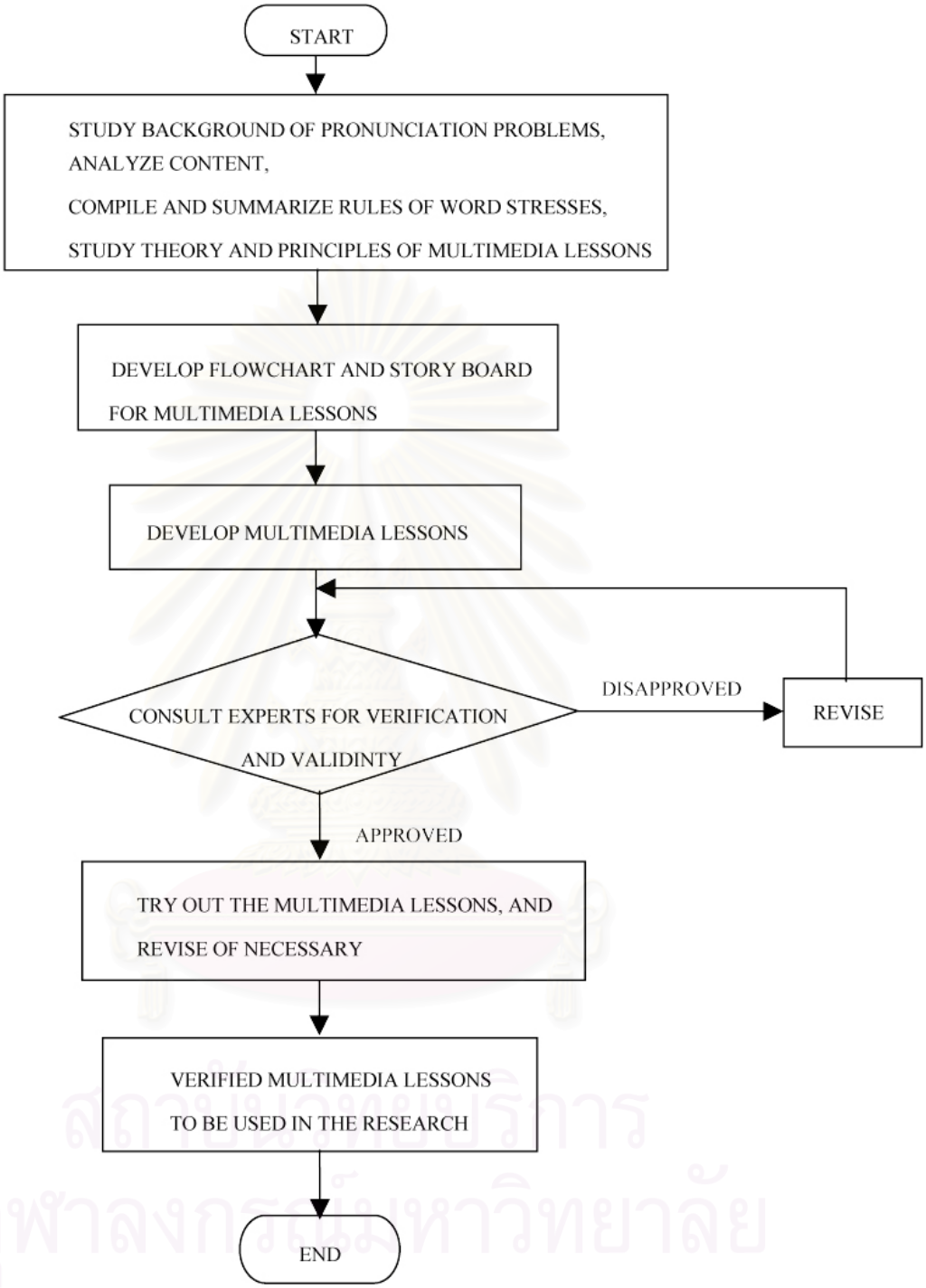


Figure 3.1 Planning and Development Procedure of multimedia programs

1.2 Multimedia lessons flowchart

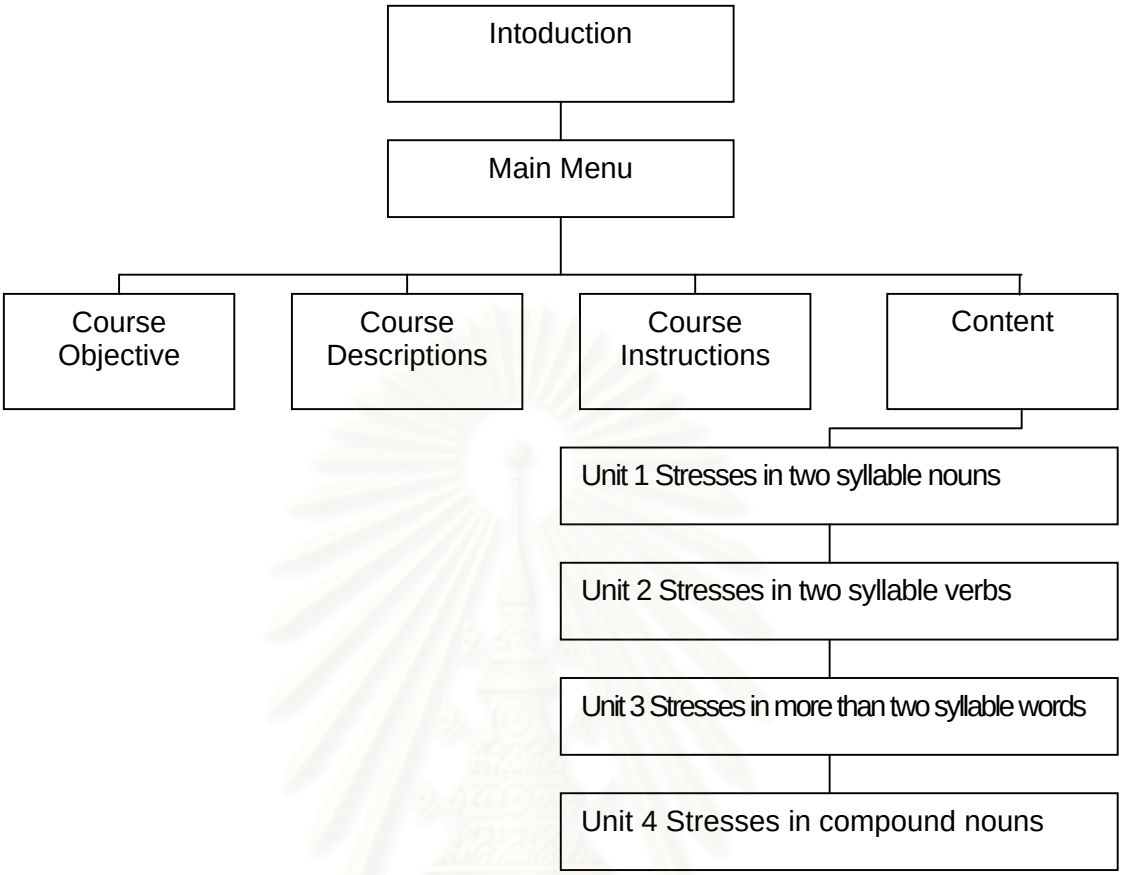


Figure 3.2 Multimedia lessons flowchart

1.3 Samples of screen designs

Figure 3.3 title page

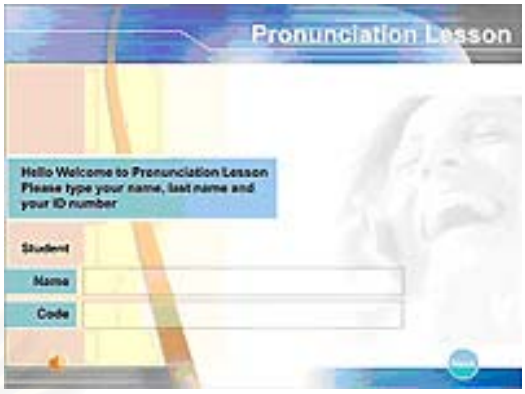


Figure 3.4 log in page

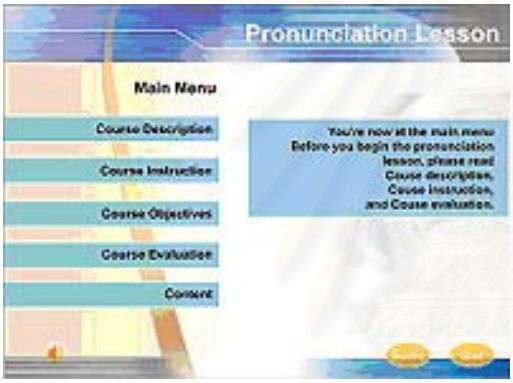


Figure 3.5 main menu

Figure 3.6 course description

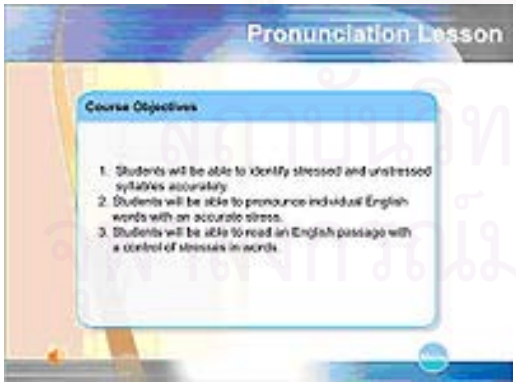


Figure 3.7 course objective

Figure 3.8 sample of practice test

Figure 3.9 feedback

Figure 3.10 drills

Figure 3.11 results

1.4 The development procedures of multimedia lessons in details. Both multimedia lesson designs followed the same procedures which consisted of seven fundamental steps as follows:

1.4.1 Identification of objectives and content

1.4.2 Development of flowchart and storyboard

1.4.3 Production of multimedia lessons

1.4.4 Verification and validation

The multimedia instrument was developed in consultation with four experts. Two of them were experts in English teaching, and the others were experts in Educational technology. The appraisal checklist: Computer-Based Instruction (Molnich, Molonde, and Russell, 1989) was applied. The checklist was in Likert scales and provided spaces for the experts to comment on strong points and weak points as well as the general comments. (see appendix A)

The strengths were as follows:

a. The design of the lessons was contemporary. The color and graphics used were in nice format and able to maintain the interest of the students.
b. The length of each unit was appropriate, meaning each unit doesn't not take too long so it should be able to maintain student's interest.
c. The exercises were useful and directly served the objectives of the course.
d. The lessons gave immediate feedback and evidence of effectiveness in the form of scores gained which were useful to students.
e. The lessons were practical and very useful for those who wanted to improve English pronunciation, especially the first year students.

The recommended actions were as follows:

a. The menu buttons should be in dark color, not in light for the ease of searching.
b. An icon " NEXT" should be included after each section so that the users wouldn't have to go back to the main menu and could continue
c. The music background became annoying after a while. It should be shorter, or better yet, the program should provide an "on and off" button.
d. There should be an audio explanation, along with the text to bring life to the lessons and to keep students' attention to the lessons.

The recommendations to revise the multimedia lessons from both theEnglish teaching experts and the Educational Communications and technology experts were followed. (see sample in appendix B)

1.5 Try-out

There were three steps of the try-out process. They are described as follows:

1.5.1 One to one try-out

A first-year student from the faculty of science was requested to take the multimedia lessons. The researcher sat with the student, observed while the student was taking the lessons, and discussed about the lessons after the student finished the lessons. The student understood the instructions and completed each unit within the time provided which was 30 minutes per unit. The level of difficulty suited his level. However, he was not sure of where to start and how to continue. He sometimes had difficulty in finding buttons because the color was so light. The buttons blended into the color of the background. The multimedia lessons were revised.

1.5.2 Small group try-out

After adding the instruction of how to use the multimedia lessons, the researcher arranged a small group try-out with eight students from the faculty of science. They were not the subjects for the experiment, and had never taken any lessons on word stresses. They were divided into two groups of four. The first group took the rhythmic multimedia lessons, while the other group took the color bar multimedia lessons. The researcher was in the computer lab with them and observed how they operated the program and the lessons. They completed each unit within the time provided. The researcher interviewed each student after they used the program. The researcher revised the lessons according to the comments which worked in sync with those of one subject try-out and those from the experts.

1.5.3 Big group try-out

The big group try-out is also known as a field trail. There were 32 students divided into two groups of 16. Each group was assigned to different multimedia lessons. The trial was done in a computer lab. The researcher explained the

objectives and the steps to the students. Everything was done in an actual atmosphere of the experimentation. The researcher was around as a helper, not a teacher. The researcher interviewed the students after they completed the lessons. Suggestions and comments were taken into consideration and revision.

2. Perceptual Learning Style Preferences (PLSP) Survey

The Perceptual Learning Style Preferences (PLSP) Survey was developed by Ried (1987). This questionnaire allowed ESL students to self-identify their preferred learning style among six categories: visual, audio, kinesthetic, tactile, group, and individual learning. The ranking scores identified major learning style preferences, minor learning style preferences, and negligible learning style preferences. However, only the major learning style preferences of the subjects were considered for this research. The survey was typed up in English. The researcher helped translated some sentences into Thai for Chulalongkorn university students. The owner of the experimental groups in China translated some sentences into Chinese. Students were allowed to use a dictionary.

3. Pretest and posttest

The pretest and the posttest were of the same test. The test was design by Dauer (1993). Tape recorders were used to record the test because this test was designed as an oral test. The test was comprised of two parts. The first part tested syllables and word stresses in discrete. There were 20 words altogether. First, the subjects were to identify the number of syllables. Then they were to read each word aloud with an appropriate stress. The second part tested stresses in two-syllable, three-syllable, and more than three-syllable words. The words were linked in sentences. The target words were printed in bold. The test and the lessons taught worked in sync in terms of objectives and level of difficulty. (see appendix C)

4. Practice activities

There were 4 practice activities included. Each practice activity was designed in sync with each lesson respectively. The activities were selected from lists of activities to extend and consolidate pronunciation skills by Kenworthy (1987). They were carefully selected to match the objectives of each unit and consulted two native experts of teaching English as a foreign language. Within 30 minutes

provided, each activity basically provided more work on identifying stress and unstressed syllables, and the research played role of facilitator. There was no teaching in the practice session; however, the researcher concluded the patterns found after each practice. Errors were corrected among students themselves. The activities were 1.ODD ONE OUT? , 2. STRESS BINGO, 3. MATCHING PATTERN, and 4. SHOUTING DICTATION. (see appendix D)

3.4 Research Procedure

1. Preparation phase

1.1 Subjects. The researcher asked for permission from the owners of the subject classes that the researcher would meet the subjects once a week for the experimental group with no practice activities and twice a week for the group with activities. It took 45 minutes for each session.

1.2 Instrumentation. The researcher prepared objectives, content, flowcharts, designs, and discussed with experts. The researcher also arranged technical facilities, including computer labs, cassette tape recorders, and microphones with technical staff wherever the studies took place. Within the time provided, subjects could be able to drill as many times as they wanted.

2. Action Phase

2.1 Random sampling. All subjects were first randomly selected into design by taking a pre-test, and posttest with non-equivalent groups experimental design to test the hypotheses.

2.2 Pretest arrangement. All subjects were later given a pre-test which was designed as an oral test using a cassette recorder to record and check for marking. The pretest was used to conduct a matched pair distribution and compare with the posttest to measure the learning achievement of the subjects.

2.3 Perceptual Learning Style Preferences (PLSP) Survey. Next, all subjects were given the Perceptual Learning Style Preferences (PLSP) Survey which was developed by Ried (1987). This questionnaire allowed ESL students to self-identify their preferred learning styles among six categories: visual, audio, kinesthetic, tactile, group, and individual learning. The ranking scores identified major learning style preferences, minor learning style preferences, and negligible learning style preferences. However, only the major learning style preferences of the subjects were considered for this research.

2.4 Learning the lessons. The duration of the experiment was six weeks. The first and the last week were scheduled for the pretest, posttest, and survey. There were four weeks for four units. Another way of saying is that the subjects were scheduled to complete one unit per week. In case a subject missed a lesson, he or she would reschedule with the researcher in person.

2.5 Posttest arrangement. The posttest will be given after the subjects finish all four units. The posttest was an oral test using a cassette recorder to record and check for marking.

3.5 Data Analysis

The statistical analysis used to process the data collected in the study in the research were means, t-tests, one-way ANOVA, two-way ANOVA (Two ways Analysis of Variance), and Multiple Variance. The mean scores was used to assign the subjects into the CAI multimedia pronunciation lessons so that there would not be any bias of the subjects in the experiment. Meanwhile, the two-way ANOVA was used to find the effects of two independent variables, and Multiple Variance was used to find the effects of three independent variables, different versions of instructional multimedia, learning exposure, and learning styles on the dependent variable: the achievement of English pronunciation.

CHAPTER 4
Data Analysis

The analysis of data of the research titled, “Effects of Rhythmic methods in multimedia lessons and learning exposure upon English pronunciation achievement of Thai and Chinese undergraduates with different learning styles” was presented in this chapter. The data were presented in tables and graphs, and the interpretation of tables and graphs were done in prose. The analyses are presented in sync with the research objectives. The objectives are to compare the learning achievement gained from different designs of multimedia pronunciation lessons of Thai and Chinese students, to compare the learning achievement gained from different design of multimedia pronunciation lessons between Thai and Chinese students, to compare the learning achievement of Thai and Chinese students who receive practice activities with that of those who do not, to compare the learning achievement between Thai and Chinese students who receive practice activities with that of those who do not., to compare the learning achievement of Thai and Chinese students who have different learning styles, to compare the learning achievement between Thai and Chinese students who have different learning styles, to identify factors that influence learning achievement of Thai and Chinese students, and to compare factors that influence learning achievement between Thai and Chinese students.

The independent variables studied were two designs of multimedia lessons, three types of learning styles, and practice activities. The dependent variable studied was learning achievement in English pronunciation. The types of learning styles included in this research were visual, audio, and kinesthetic preference learning styles. The tactile learning style was not included in this study because this type of learning style was considered rare among Asian students (Reid, 1995). Out of 102 students, both Thai and Chinese subjects, there were only three Thai subjects and two Chinese subjects identified themselves as tactile learners. This number was too few to be used for the statistical analysis; therefore, tactile preference learning style learners were excluded from the study.

The analysis of data are presented in four major parts as follows:

1. The comparison of the learning achievement gained from different designs of multimedia pronunciation lessons of Thai and Chinese students and the comparison of the learning achievement gained from different design of multimedia pronunciation lessons between Thai and Chinese students.

2. The comparison of the learning achievement of Thai and Chinese students who receive practice activities with that of those who do not and the comparison of the learning achievement between Thai and Chinese students who receive practice activities with that of those who do not.

3. The comparison of the learning achievement of Thai and Chinese students who have different learning styles, and The comparison of the learning achievement between Thai and Chinese students who have different learning styles.

4. The identification of factors that influence learning achievement of Thai and Chinese students, and the comparison of factors that influence learning achievement between Thai and Chinese students.

Part 1 The comparison of the learning achievement gained from different designs of multimedia pronunciation lessons of Thai and Chinese students and the comparison of the learning achievement gained from different design of multimedia pronunciation lessons between Thai and Chinese students. This part was done to prove hypothesis number 1 which was the posttest scores are significantly higher than the pretest scores.

Thai subjects

Table 4. 1 comparison of methods for Thai students

Posttest	Methods	n	Mean	Std deviation	Std error mean
SCORE	Ball	29	18.8387	2.7940	0.5018
	Bar	30	16.8065	3.0047	0.5397

From the table shown above, the posttest scores of Thai students were shown. There were 59 students included in this study. There were 29 students who have used the rhythmic multimedia pronunciation lessons, 30 students who have

used the color-bar multimedia pronunciation lessons. The mean score of the first group was 18.89, and the mean score of the second group was 16.80.

To test this hypothesis, an independent samples t-test was applied. The result was shown in table 4.2.

Table 4. 2 statistical result of method comparison for Thai students

Methods		n	Posttest scores		t	Sig.
			Mean	S.D.		
Thai	Ball	29	18.89	2.88	2.71	0.27
	Bar	30	16.80	3.05		

* Significant at 0.05 level

The interpretation of the table at the significant level of 5% as the cutoff point is equivalent to using the 95% confidence interval. The T-score is 2.71, and the significant level is 0.27, which is higher than 0.05. The null hypothesis that the learning achievements of Thai students gained by different designs of multimedia pronunciation lessons are not significantly different. The hypothesis was accepted.

Chinese subjects

Table 4.3 comparison of methods for Chinese students

Posttest	Methods	n	Mean	Std deviation	Std error mean
Score	Ball	19	17.84	2.50	0.55191
	Bar	19	14.10	2.82	0.64848

From the table shown above, the posttest scores of Chinese students were shown. There were 38 students included in this study. 19 students have used the rhythmic multimedia pronunciation lessons, and another 19 have used the color-bar multimedia pronunciation lessons. The mean score of the first group was 17.84, and the mean score of the second group was 14.10.

To test this hypothesis, an independent samples t-test was applied. The result was shown in table 4.4.

Table 4.4 statistical result of method comparison for Chinese students

Methods		n	Posttest scores		t	Sig.
			Mean	S.D.		
Chinese	Ball	19	17.84	2.50	4.31	0.73
	Bar	19	14.10	2.82		

* Significant at 0.05 level

The interpretation of the table at the significant level of 5% as the cutoff point is equivalent to using the 95% confidence interval. The T-score is 4.31, and the significant level is 0.73, which is higher than 0.05. The null hypothesis that the learning achievements of Chinese students gained by different designs of multimedia pronunciation lessons are not significantly different was accepted. This means that there is no significant difference found from the learning achievement gained from different pronunciation teaching methods in Chinese students.

To compare the learning achievement between Thai and Chinese subjects gained from different pronunciation teaching methods, T-test was applied. The result of method comparison between Thai and Chinese subjects can be found in table 4.5.

Table 4.5 comparison of methods between Thai and Chinese students

	Thai N=59		Chinese N=38			
Methods	Mean	S.D.	Mean	S.D.	t	Sig.
Ball	18.89	2.88	17.84	2.50	1.34	0.85
Bar	16.80	3.05	14.10	2.82	3.15	0.37

* Significant at 0.05 level

The table above shown that there was no significant difference between the learning achievement of Thai students and Chinese students gained from different pronunciation teaching methods at the significant level of 0.05.

Part 2 The comparison of the learning achievement of Thai and Chinese students who receive practice activities with that of those who do not and the comparison of the learning achievement between Thai and Chinese students who receive practice activities with that of those who do not.

Table 4.6 description of practice and no practice comparison

Subjects	n	Posttest scores Practice		Posttest scores No Practice		T	Sig.
		Mean	S.D.	Mean	S.D.		
Thai	59	18.57	3.38	16.68	3.40	2.31	0.13
Chinese	38	17.19	2.74	15.73	2.42	0.12	0.18

* Significant at 0.05 level

From the table 4.6, there were 59 Thai students included in this study. 29 students have been assigned to the rhythmic ball queuing multimedia pronunciation lessons, and within this group 14 students have received practice activities while 15 have not. The second group was the students who were assigned to the color-bar version. There were 30 of them. The number of students who students have been assigned to the color-bar queuing multimedia pronunciation lessons with practice activities was 15, and the number of students who have been assigned to the color-bar multimedia pronunciation lessons with no practice activities was 15. The mean score of all Thai subjects who have received practice activities was 18.57 while the mean score of all Thai subjects who have not received practice activities was 16.68.

As for the Chinese subjects, there were 38 Chinese students included in this study. The first group included 19 subjects who have been assigned to the rhythmic ball queuing multimedia pronunciation lessons, and within this group 8 students have received practice activities while the rest has not. The second group also included 19 subjects who have been assigned to the rhythmic color-bar queuing multimedia pronunciation lessons, and within this group 8 students have received practice activities while the rest has not. The mean score of all Chinese subjects who have received practice activities was 17.19 while the mean score of all Thai subjects who have not received practice activities was 15.73.

To test the hypothesis, an independent sample t-test was applied for each case. When compared the learning achievements of Thai subjects who have received practice activities with that of those who have no practice activities, the significant level found was 0.13. When compared the learning achievements of Chinese subjects who have received practice activities with that of those who have no practice activities, the significant level found was 0.18. Since the significant values of both cases were greater than 0.05, the learning achievement of students who were assigned to the both multimedia lessons either with or without practice activities was not significantly different.

Table 4.7 statistical result of practice and no practice comparison

Source	Type III Sum of Squares	df	MS	F	Sig.
Corrected Model	98.391	3	32.797	3.591	0.017
Intercept	26838.231	1	26838.231	2938.197	0.000
NATION	64.547	1	64.547	7.066	0.009
PRAC	31.211	1	31.211	3.417	0.068
NATION x PRAC	1.070	1	1.070	0.117	0.733
Error	849.485	93	9.134		
Total	29665.000	97			
Corrected Total	947.876	96			

* Significant at 0.05 level

The table above showed that there was no significant difference found when the learning achievements of Thais and Chinese were compared since the significant level found was 0.73 which was higher than 0.05. So the conclusion was there was no significant difference between learning achievements gained from Thai and Chinese students who have received practice activities and that of those who have not received ones.

Part 3 The comparison of the learning achievement of Thai and Chinese students who have different learning styles, and The comparison of the learning achievement between Thai and Chinese students who have different learning styles.

Table 4.8 number of Thai subjects grouped by learning styles

	Learning Styles	n
Ball	Visual	13
	Audio	9
	Kinesthetic	7
Bar	Visual	13
	Audio	10
	Kinesthetic	7
Total		59

The total number of the Thai subjects was 59. Of the total number, 26 had visual learning preference, 19 had audio learning preference, and 14 had kinesthetic learning preference learning styles.

Table 4.9 number of Thai subjects grouped by learning styles

	Learning Styles	n
Ball	Visual	9
	Audio	6
	Kinesthetic	4
Bar	Visual	9
	Audio	6
	Kinesthetic	4
Total		38

The total number of the Thai subjects was 38. Of the total number, 18 of them had visual learning preference, 12 had audio learning preference, and 8 had kinesthetic learning preference learning styles.

Table 4.10 learning achievements gained from different learning style learners

Subjects	n	Posttest scores					
		Visual		Audio		Kinesthetic	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
Thai	59	19.29	3.02	16.25	2.61	17.25	2.76
Chinese	38	16.24	3.00	14.90	2.50	16.50	3.27

From the table above, the mean scores of both Thai and Chinese subjects were shown in relation with the learning styles. The first group was the mean scores of Thai subjects. The mean score of those who had visual preferences was 19.29. The mean score of those who had audio preferences was 16.25. The mean score of those who had kinesthetic preferences was 17.25. The second group was the mean scores of Chinese subjects. The mean score of those who had visual preferences was 16.24. The mean score of those who had audio preferences was 14.90. The mean score of kinesthetic preferences was 16.50.

The table above also showed that the total number of the Thai and Chinese subjects was 97. Of the total number of students and the mean scores, Thai students who had visual learning preference gained the highest mean score (19.29), while Thai students who had audio learning preference gained the lowest mean score (16.25). Chinese students who had kinesthetic learning preference gained the highest mean score (16.50), while Chinese students who had audio learning preference gained the lowest mean score (14.90), and it was also the lowest of all.

To test whether there was a significant difference between the learning achievements gained from students with different learning styles, and whether there was a significant difference between the learning achievements gained from Thai and Chinese subjects, two-way ANOVA was applied.

Table 4.11 statistical result between achievement and learning styles

Source	Type III Sum of Squares	df	MS	F	Sig.
Corrected Model	200.811	5	40.162	4.892	0.001
Intercept	23263.474	1	23263.474	2833.724	0.000
STYLE	108.304	2	54.152	6.596	0.002*
NATION	47.066	1	47.066	5.733	0.019
STYLE x NATION	11.517	2	5.758	0.701	0.499
Error	747.065	91	8.210		
Total	29665.000	97			
Corrected Total	947.876	96			

* Significant at 0.05 level

The table above showed that there was a significant difference of the learning achievements gained from different learning style learners. The significant value was 0.002. The hypothesis that the learning achievements gained by Thai students with different learning styles was accepted. However, there was no significant difference between the learning achievements gained by Thais and those of Chinese.

Since there was a significant difference found, a Post Hog analysis was applied to test in pairs.

Table 4.12 Post Hog analysis among learning styles

Learning Styles	Mean	Visual 19.29	audio 16.25	kinesthetic 17.25
Visual	19.29	-	3.04*	2.04
Audio	16.25		-	1.00
Kinesthetic	17.25			-

* Significant at 0.05 level

Table 4.11 showed that there was a significant difference of the learning achievements gained between subjects who had visual leaning styles and that of those who had audio learning styles.

Part 4 The identification of the interaction among factors that influence learning achievement of Thai and Chinese students. The comparison of factors that influence learning achievement between Thai and Chinese students. The factors studied were teaching methods presented in forms of the two designs of multimedia pronunciation lessons, practice activities, and learning styles preferences including visual, audio, tactile, and kinesthetic,. The hypothesis that there is interaction between methods presented, learning exposure, and learning styles on the achievement of English pronunciation was proved by the statistic multiple variance.

Table 4.13 description of three independent variables studied in Thai subjects

			Learning Styles					
			Visual		Audio		Kinesthetic	
Methods	n		Mean	S.D.	Mean	S.D.	Mean	S.D.
Ball	29	Prac.	22.28	3.30	18.00	0.00	13.33	1.52
		Noprac	18.83	1.60	17.66	1.75	16.28	1.50
Bar	30	Prac.	18.14	2.41	16.00	2.96	16.00	2.82
		Noprac	17.85	2.47	13.80	2.16	18.33	5.03

The table above showed that the total number of the Thai subjects were 59. Of the total number of students and the mean scores, Thai students who experienced the rhythmic ball queuing multimedia lessons, had visual learning preference, and received practice activities gained the highest mean score (22.28), while Thai students who experienced the color-bar queuing multimedia lessons, received no practice activities, and had audio learning preference gained the lowest mean score (13.80).

Table 4. 14 statistical result of interaction among three variables of Thai subjects

Source	Type III Sum of Squares	df	MS	F	Sig.
Corrected Model	265.434	11	24.130	3.803	0.001
Intercept	15540.089	1	15540.089	2449.369	0.000
METHOD	43.856	1	43.856	6.912	0.012
PRAC	12.596	1	12.596	1.985	0.165
STYLE	99.635	2	49.817	7.852	0.001*
METHOD x PRAC	11.353	1	11.353	1.789	0.187
METHOD x STYLE	15.507	2	7.754	1.222	0.304
PRAC x STYLE	7.906	2	3.953	.623	0.541
METHOD x PRAC x STYLE	23.482	2	11.741	1.851	0.168
Error	298.193	47	6.345		
Total	19357.000	59			
Corrected Total	563.627	58			

* Significant level at 0.05

When the posttest scores were treated as the dependent variable, there were between-subjects effects at the 95% confidence interval. The significant level was higher than 0.05 (=0.168 on this case). There was no interaction effect found among independent variables included in this study, namely different designs of multimedia pronunciation lessons, learning styles, and practice activities on the achievement of English pronunciation. The hypothesis that there is interaction between designs, practice activities, and learning styles on the learning achievement was rejected.

Table 4.15 description of three independent variables studied in Chinese subjects

Methods	n		Learning Styles: Visual Mean	Visual S.D.	Audio Mean	Audio S.D.	Kinesthetic Mean	Kinesthetic S.D.
Ball	18	Prac.	20.00	2.94	16.33	1.52	19.50	3.53
		Noprac	18.25	1.25	15.33	0.54	17.50	3.53
Bar	18	Prac.	15.20	2.77	14.66	4.50	14.50	0.70
		Noprac	15.16	2.22	12.50	0.70	14.50	2.12

As for the Chinese side, students who experienced the rhythmic multimedia lessons, had visual learning preference, and received practice activities gained the highest mean score (20.00), while those who experienced the color-bar multimedia lessons, received no practice activities, and had audio learning preference gained the lowest mean score (12.50).

Table 4. 16 statistical result of interaction among three variables of Chinese subjects

Source	Type III Sum of Squares	df	MS	F	Sig.
Corrected Model	159.432	11	14.494	2.314	0.039
Intercept	8570.130	1	8570.130	1367.994	0.000
METHOD	95.148	1	95.148	15.188	0.001*
PRACTICE	11.062	1	11.062	1.766	0.195
STYLE	40.808	2	20.404	3.257	0.055
METHOD2 x PRAC2	1.489	1	1.489	0.238	0.630
METHOD2 x STYLE2	5.558	2	2.779	0.444	0.647
PRAC2 x STYLE2	.842	2	0.421	0.067	0.935
METHOD2 x PRAC2 x STYLE2	4.216	2	2.108	0.337	0.717
Error	162.883	26	6.265		
Total	10308.000	38			
Corrected Total	322.316	37			

* Significant level at 0.05

When the posttest scores were treated as the dependent variable, there were between-subjects effects at the 95% confidence interval. The significant level was higher than 0.05 (=0.717 on this case). There was no interaction effect found among independent variables included in this study, namely different designs of multimedia pronunciation lessons, learning styles, and practice activities on the achievement of English pronunciation. The hypothesis that there is interaction between designs, practice activities, and learning styles on the learning achievement was rejected. There was no interaction among independent variables found in both cases.

To sum up the findings of this study, the information is presented in sync with research objectives and research hypotheses.

Objective 1 to compare the learning achievement gained from different designs of multimedia pronunciation lessons of Thai and Chinese students

Hypothesis 1 the learning achievements of Thai and Chinese students gained by different designs of multimedia pronunciation lessons are not significantly different.

Objective 2 to compare the learning achievement gained from different design of multimedia pronunciation lessons between Thai and Chinese students

Hypothesis 2 the learning achievements between Thai and Chinese students gained by different designs of multimedia pronunciation lessons are not significantly different

The result of the statistical analysis conforms to the hypothesis that the learning achievements gained by different designs of multimedia pronunciation lessons are significantly different in Thai subjects, but not to the case of the Chinese subjects. Besides, there was no significant difference found between both groups.

There are two different methods of teaching presented in the multimedia pronunciation lessons. The first one is called the rhythmic ball queuing version (Kenworthy, 1987) using moving balls to teach and show the stressed and unstressed syllables. The other is called the color-bar queuing version (Underhill, 1990) using color-bar with light and dark colors to emphasize the stressed and unstressed syllables. The features of the rhythmic version should enhance the ability to achieve the lessons because English is a rhythmic language composing of stresses and intonation (Kenworthy 1987, Underhill, 1990, and Mortimer, 1985).

This result brings to the discussion about two subject matters. The first one is media attributes. Media attributes cover the ability of media to properly serve nature of content, objectives, and learner characteristics. Therefore, any kinds of media that are carefully designed yield benefits to learners. The media presented in this study are qualified because the subjects gained no matter what presented.

The second one is factors that influence English Learning achievement, and similarities as well as differences in background and lifestyles. Clennell (1997) studied that there were three major factors the influenced the ability to learn the second language. They were learners' first language, affective variables, and age. Kenworthy (1987) stated that native language, age, exposure, innate phonetic ability, identity of language ego, motivation, and concern for good pronunciation. Besides, the achievement gained in the study might be resulted partly from the factors mentioned above and the lifestyles. It seems that there are varieties of background found in Thai students. They have varieties of exposure with uncertain amount of time. However, the Chinese subjects seem to be more unique since they are from similar background families and there are not many varieties of exposure they can encounter. Most of the Chinese subjects live on campus and have the same types of facilities. Thai and Chinese subjects have some similarities and some differences in background and lifestyles.

Objective 3 to compare the learning achievement of Thai and Chinese students who receive practice activities with that of those who do not

Hypothesis 3 the learning achievements gained by Thai and Chinese students who receive practice activities and that of those who do not receive the treatment are significantly different,

Objective 4 to compare the learning achievement between Thai and Chinese students who receive practice activities with that of those who do not

Hypothesis 4 the learning achievements gained by Thai and Chinese students who receive practice activities and that of those who do not receive the treatment are significantly different

The result showed that there was no significant difference on the learning achievement of the subjects who have received practice activities from those who have not. There was also no significant difference within and between the groups.

According to the observation of the researcher, the subjects felt tensed when they were asked to read and tape record for the pretest. However, they became more at ease when they were asked to do the same for the posttest. They read very slowly for the pretest. This made them sound unnatural. After four weeks of practices, the subjects who have received practices appeared more comfortable when they spoke or read words. Brown (1994) stated practices do not necessarily provide accuracy,

but they provide fluency. The finding comforts to this study that to practice is to create skills.

Objective 5 to compare the learning achievement of Thai and Chinese students who have different learning styles

Hypothesis 5 the learning achievements gained by Thai and Chinese students with different learning styles are significantly different,

Objective 6 to compare the learning achievement between Thai and Chinese students who have different learning styles

Hypothesis 6 the learning achievements gained between Thai and Chinese students with different learning styles are significantly different

There was a significant difference on the learning achievement of and between Thai and Chinese subjects. The result showed that subjects with visual learning styles gained the highest mean scores in both groups, especially when they were assigned to the rhythmic version. Learning styles results (Reid 1987) suggested that students who preferred kinesthetic learning have more confidence as well as more positive attitudes and beliefs about foreign language learning than students with other perceptual learning style preferences. Students with the Individual preference style use more language – learning strategies, and they are less tolerant of ambiguity. Students with an Auditory preference like to make friends with and speak with foreign language speakers. The result does not conform to this suggestion; however, the classroom conditions and the teaching methods should be considered. Reid (1987)possibly referred to traditional classroom where a teacher is the center, and there should be interactions between a teacher and students to promote abilities to speak the target language or to communicate in the target language. This practice seems to work well with Kinesthetic because they learn best by experience, by being involved physically in classroom experiences. They remember information well when you actively participate in activities, field trips, and role-playing in the classroom. A combination of stimuli-for example, an audio-tape combined with an activity-will help them understand new material. The lessons in this study were presented in the form of computer- assisted instruction. This type of teaching allows students to study on their own at the learning pace. The basic skills that the students exercise are visual and audio. This significantly supports those who have visual learning style. Visual learners learn well from seeing words in books, on

the chalkboard, and in workbooks. They remember and understand information and instructions better if they read them. They don't need as much oral explanation as an auditory learner, and they can often learn alone with a book. They should take notes of lectures and oral directions if they want to remember the information. The noticeably features of the computer-assisted instruction presented in this study support visual learning styles.

Lynn O'Brien (1989) found in her study that teachers were substantially more Auditory than the students (70% to 43%). We can therefore expect that those teachers feel comfortable instructing by lecture, which supports in which she claimed that 80 percent of instruction was delivered in an auditory fashion, In contrast, students, with their significantly greater Visual orientation, reported that they learned more by reading textbooks than by listening to lectures. Those students might learn more effectively from approaches and activities better suited to the Visual and Tactile styles.

So, teachers should be aware of students' learning styles and need to take risks to integrate more teaching styles into their class preparation even though they may not feel entirely comfortable teachers of the students.

Objective 7 to identify factors that influence learning achievement of Thai and Chinese students

Hypothesis 7there is correlation among factors presented, namely multimedia pronunciation lessons, practice activities, and learning styles on the learning achievement of Thai and Chinese students

Objective 8 to compare factors that influence learning achievement between Thai and Chinese students.

Hypothesis 8 there is a significant difference between factors that influence learning achievement of Thai students and the factors that influence that of Chinese students

The result showed that there was no interaction among factors presented and a significant difference between factors that influence learning achievement of Thai students and the factors that influence that of Chinese students.

The result that there was interaction among factors that influenced on learning achievement of Thai and Chinese students, and between Thai and Chinese students. Though, there was no interaction found in this study. The mean score of the students who have experienced the rhythmic ball queuing version and received practice activities was the highest. The highest group of all is those who have experienced these two variables and have visual learning styles. This should imply that methods, practice activities, and learning styles are somewhat relevant.

In learning a foreign language, many skills have to be exercised at the same time. Reid (1987)mentioned that in a formal learning setting where the target language was learned a foreign language and linguistic accuracy, the major concern was that students tend to be more visual, while in an informal learning situation in which communicative fluency is emphasized, students may tend to be more auditory or kinesthetic.

In any classroom, mismatches do exist between teachers' and students' styles. Teachers need to make conscious efforts to improve this teaching/learning conflict. Teachers have to be aware of students' learning styles as well as their own learning/teaching styles. If student styles do not match the teacher's, both the students and the teacher should be aware of the differences and the possible consequences of those differences. Teachers also have a responsibility to provide multiple opportunities for their students to investigate and identify their learning styles (Reid 1987).

CHAPTER 5
Research Summary and Conclusions

The summary and conclusions of the research titled, “Effects of Rhythmic methods in multimedia lessons and learning exposure upon English pronunciation achievement of Thai and Chinese undergraduates with different learning styles” were presented in this chapter. Both the summary and the conclusions were presented in prose in coherent with the research objectives and research hypotheses. Part one of this chapter was the research summary, and part two of this chapter presented the conclusions of this study.

The objectives are to compare the learning achievements gained from different designs of multimedia pronunciation lessons of Thai and Chinese students, to compare the learning achievements gained from different design of multimedia pronunciation lessons between Thai and Chinese students, to compare the learning achievements of Thai and Chinese students who receive practice activities with that of those who do not, to compare the learning achievements between Thai and Chinese students who receive practice activities with that of those who do not, to compare the learning achievements of Thai and Chinese students who have different learning styles, to compare the learning achievements between Thai and Chinese students who have different learning styles, to identify factors that influence learning achievement of Thai and Chinese students, and to compare factors that influence learning achievement between Thai and Chinese students.

The null hypotheses are that the learning achievements of Thai and Chinese students gained by different designs of multimedia pronunciation lessons are not significantly different, the learning achievements between Thai and Chinese students gained by different designs of multimedia pronunciation lessons are not significantly different, the learning achievements gained by Thai and Chinese students who receive practice activities and that of those who do not receive the treatment are not significantly different, the learning achievements gained between Thai and Chinese students who receive practice activities and that of those who do not receive the treatment are not significantly different, the learning achievements gained by Thai and Chinese students with different learning styles are not significantly different, the learning achievements gained between Thai and Chinese students with different

learning styles are not significantly different, there is correlation among factors presented, namely multimedia pronunciation lessons, practice activities, and learning styles on the learning achievement of Thai and Chinese students, there is a significant difference between factors that influence learning achievement of Thai students and the factors that influence that of Chinese students.

Part 1 Research summary

The subjects in this study were fifty-nine first-year Thai undergraduates from the faculty of Sciences of Chulalongkorn University, Thailand and thirty-eight first-year Chinese undergraduates from the teacher's college majoring in Physics of Guangxi Normal University, China. They were first selected for the research by simple random sampling, and then divided into two groups by matched-pair distribution using the pretest scores. The researcher hoped that this study can be used to help Asian students develop their English pronunciation so that they can use English more effectively in terms of oral communication.

The experimental design with pretest and posttest was used in this study. The subjects were randomly selected into design. The main instruments in the study were consisted of two different designs of CAI multimedia pronunciation lessons using drills, the perceptual learning styles preferences (PLSP) survey, and pronunciation practice activities. The statistics used to analyze the data were t-test, one-way ANOVA, and Multiple Variance.

The findings of the research were that there was no significant difference on the learning achievement of Thai and Chinese students using from different pronunciation multimedia lessons, and between Thai and Chinese students at 95% confidence level. In addition, there was no significant difference on the learning achievement of Thai and Chinese students who have received practice activities and no practice activities, and between Thai and Chinese students at 95% confidence level. However, there was a significant difference on the learning achievement of Thai and Chinese students who have different learning styles, between Thai and Chinese students students who have different learning styles also at 95% confidence level. Finally, it was observed that there was no correlation among factors that influence learning achievement of Thai and Chinese students, and between Thai and Chinese students at 95% confidence level.

Part 2 Research Discussions

1. Research Discussions on the rhythmic methods

According to the research objective # 1 and #2, the researcher tried to study if there was a difference between the learning achievements gained from different designs of multimedia pronunciation lessons which were used to teach English pronunciation to the subjects. However, there was no significant difference found from the learning achievements gained from the different designs. The word "different designs" in this study referred to the ball queuing and the color-bar queuing. The ball queuing was one of the pronunciation teaching methods using moving balls with different colors and sizes to identify stressed and unstressed syllables. Meanwhile, the color-bar queuing was also one of the pronunciation teaching methods. The color bars with dark and light red colors were used to identify stressed and unstressed syllables. From their outstanding features, both of them were considered rhythmic methods. Since English is a rhythmic language (Kenworthy, 1987), both teaching methods served the purpose of the content very well. The findings confirmed that the rhythmic methods using the ball queuing and the color-bar queuing were effective methods to teach English pronunciation, especially word stresses. However, the researcher did not touch the stresses of the sentence level and the intonation pattern. Therefore, it is suggested the study of using both methods for the sentence level and the sentence intonation should be done. Furthermore, there should be a study to compare either one of this method with other methods which are not considered rhythmic methods.

2. Research Discussions on the learning exposure

The focus of the learning exposure in this study was on the practice activities that had been done inside the classroom. There were four practice activities included. Each activity took 20 to 30 minutes. The objective of the practice activities was to get the subjects to review the rules of word stresses the students learned from the multimedia pronunciation lessons. The researcher was in the classroom as a facilitator giving instructions, explaining the steps, providing materials, but not teaching the lessons. The correct answers could be drawn from the students discussions and the answer guides. The findings were that there was no significant difference on the learning achievements between that of those who have received the practice activities and that of those who have not.

The discussions from the findings could be drawn to three points.

First, the teaching techniques. This is because the multimedia programs themselves were designed to be drills. The programs readily provided practices to the students, and from the outstanding features of the CAI multimedia students could drill, repeat the words as many times as they wanted. Therefore, drills, or practices after the lessons did not influence on the learning achievements in this case.

Secondly, the self motivation. Most students actively participated in the activities. They were aware that English was important and would be them to a good career. In the meantime, some students were not self-motivated individuals. They realized that the practice activities given were part of the experiment and there would be no points given. So they were present, but did not fully participate or try to figure out how words were pronounced. This can occur in any study. Therefore, keeping a record of attendance or a score card should be done to motivate the subjects.

Thirdly, Brown (1994) stated that practice does not necessary yield accuracy, but it yields fluency. This is because to practice is to do something over and over, and this behavior can create skill which is very important in learning a foreign language. Though, the learning achievements of those who have received practice activities were not significantly different from that of those who have received practice activities, the researcher found the majority of students who have received practice activities felt at ease when they were asked to read the passage. As an English instructor, a researcher strongly agree that practice activities should be included in a curriculum, especially when the speaking skill is concerned. This is the environment that the learners are in is the Thai or Chinese speaking environment. It is difficult for the students to review or to familiarize themselves with the language, including all four skills.

3. Research Discussions on the learning styles

Based on the findings of this research, Learning styles did affect the learning achievements of the students. Students who had visual preference learning styles gained the highest scores of all. The second came to the learners with kinesthetic learning preference. The audio preference learners gained the lowest scores. However, this study did not include tactile preference learners. For the reason that this type of learning styles was rare. The learning achievements gained

can not be a measurement and label good or bad students. Both teachers and students will be comfortable in class if the teaching styles match the learning styles. If a learning style conflict does occur, the affected students may become bored, inattentive, discouraged, and do poorly on tests (Felder and Henriques 1995).

Effective teaching requires teachers' awareness of students' individual differences and teachers' willingness to vary their teaching styles to match with most students'. An eclectic approach to classroom teaching is the rational solution. The more able and willing the teachers are to observe their students and to integrate appropriate material presentation and class assignments that match their students' learning styles, the more easily and efficiently their students will learn (Smalley and Hank 1992). That is, students learn more from teachers who are interested in their subjects and their students, and who are more flexible and tolerant in their teaching.

There should also be a study emphasizing on helping students with audio and tactile learning styles learn English better. The media or tool should be designed especially to serve their habits of learning. As a teacher teaching a foreign language, a teacher should willingly to explore methods or paths that match with the receiver channel. An Eclectic approach is recommended for there are a variety of teaching methods. Therefore, it would be beneficial to students with different learning styles if there is a research exploring channel and media that give the best benefit to learners of all types, including the tactile.

As far the findings concerned, apart from the methods used in presenting the content, a language teacher should also include learning exposure as well as learning style differences into consideration when planning a lesson or developing a curriculum.

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APPENDICES

Appendix A : Appraisal checklist

Appraisal checklist : Computer – Based Instruction

Title _____

Source _____

Lengthen (completion time) Range _____ to _____ minutes, Average _____ minutes

Designed for what system ?_____ Memory required ? _____

Subject area _____

Intended audience _____

Objectives (stated or Implied) :

Brief Description :

Entry Capabilities Required :

- Prior subject matter Knowledge/vocabulary
- Reading ability

Rating	High	Medium	Low	Comment
Relevance to objectives				
Accuracy of information				
Likely to arouse/maintain interest				
Ease of use ("user friendly")				
Appropriate color, sound, graphics				
Frequent, relevant practice (active participation)				
Feedback provides remedial branches				
Free of technical flaws (e.g., dead ends, Infinite loops)				
Clear, complete documentation				
Evidence of effectiveness (e.g., field lost results)				

Strong Points :

Weak Points :

Reviewer_____

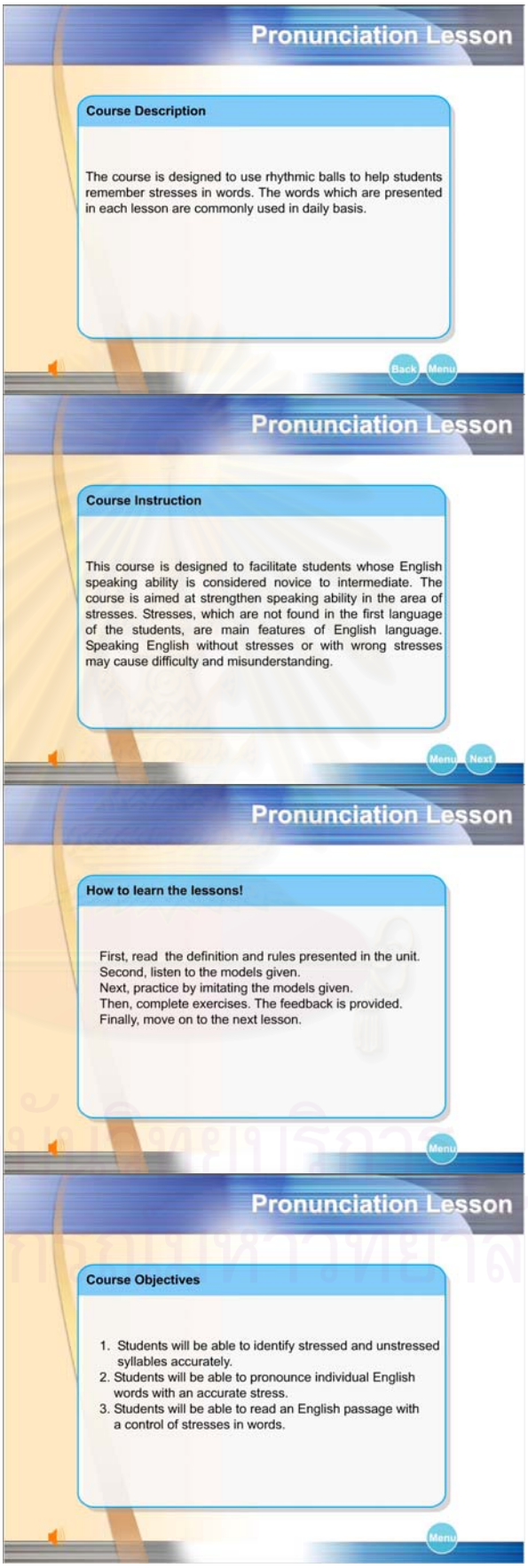
Position_____

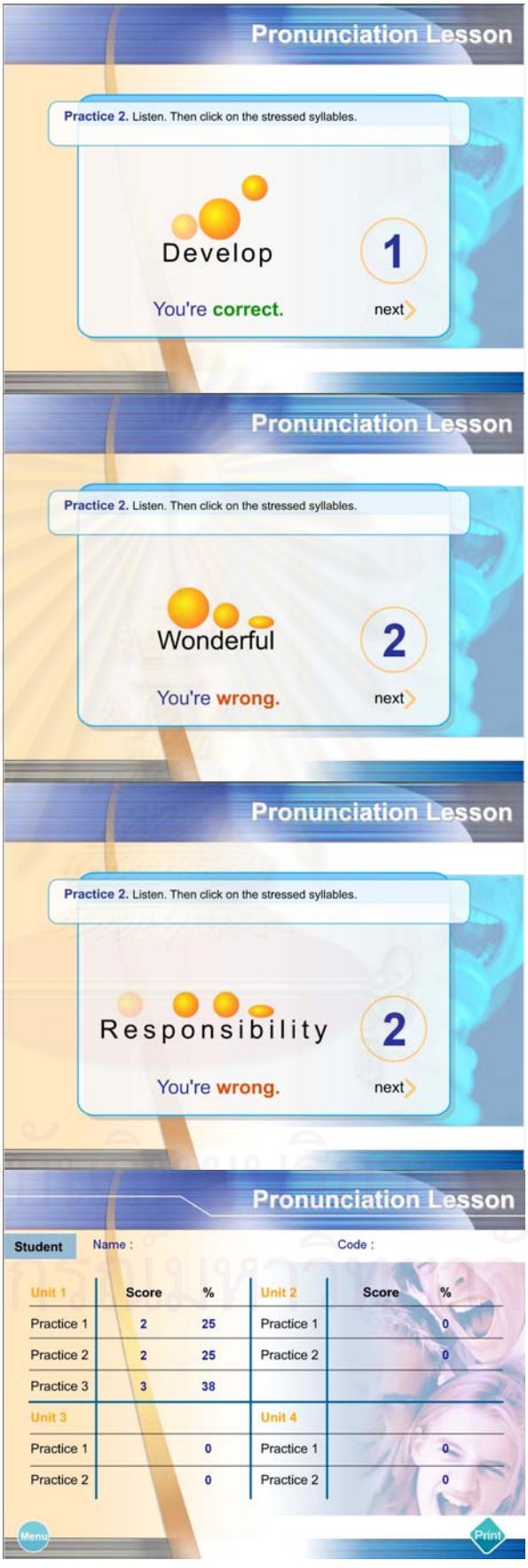
Recommended action_____

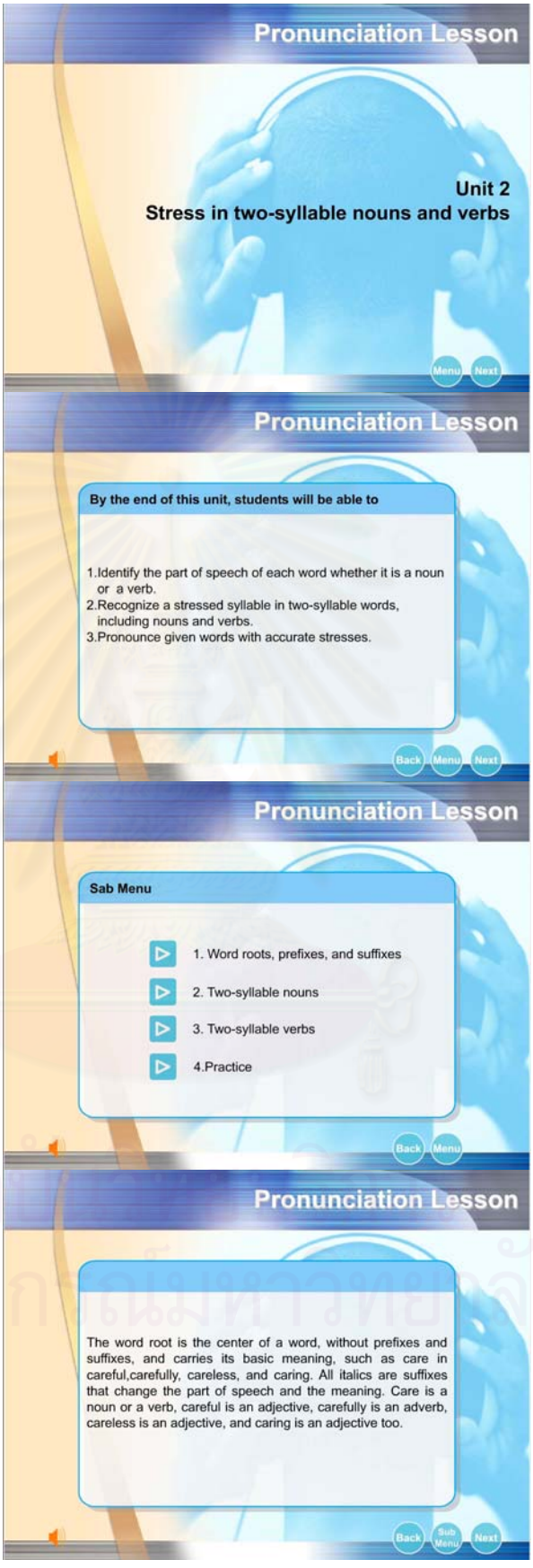
Date_____

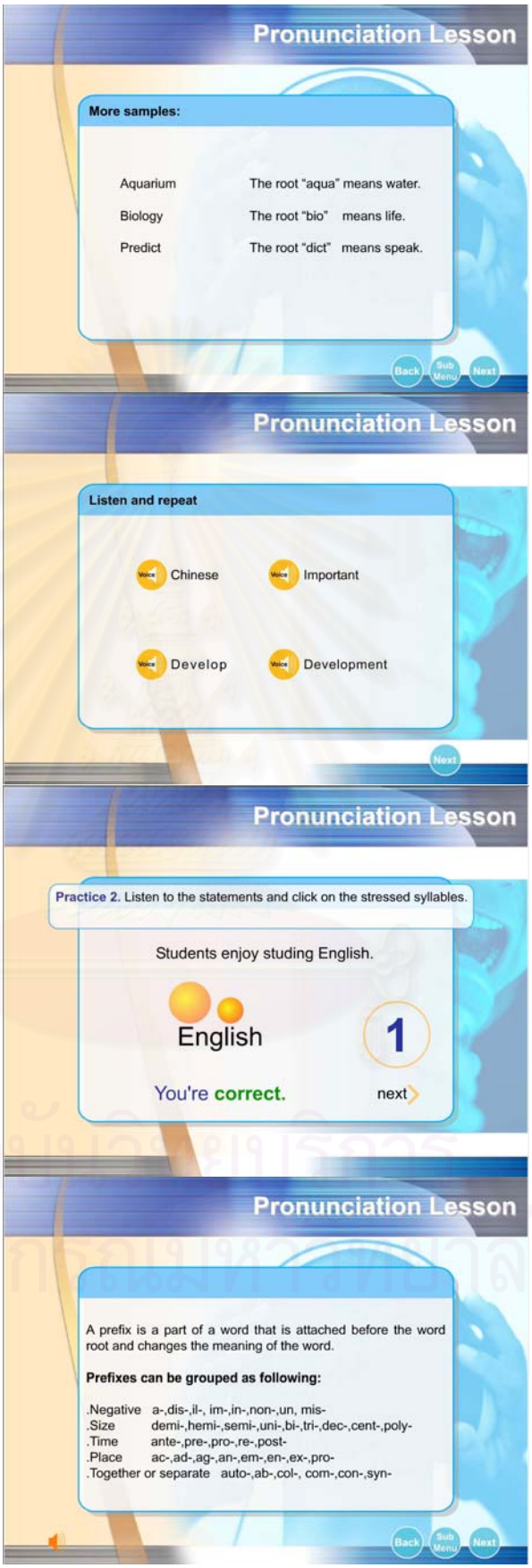
From : INSTRUCTIONAL MEDIA, 1993

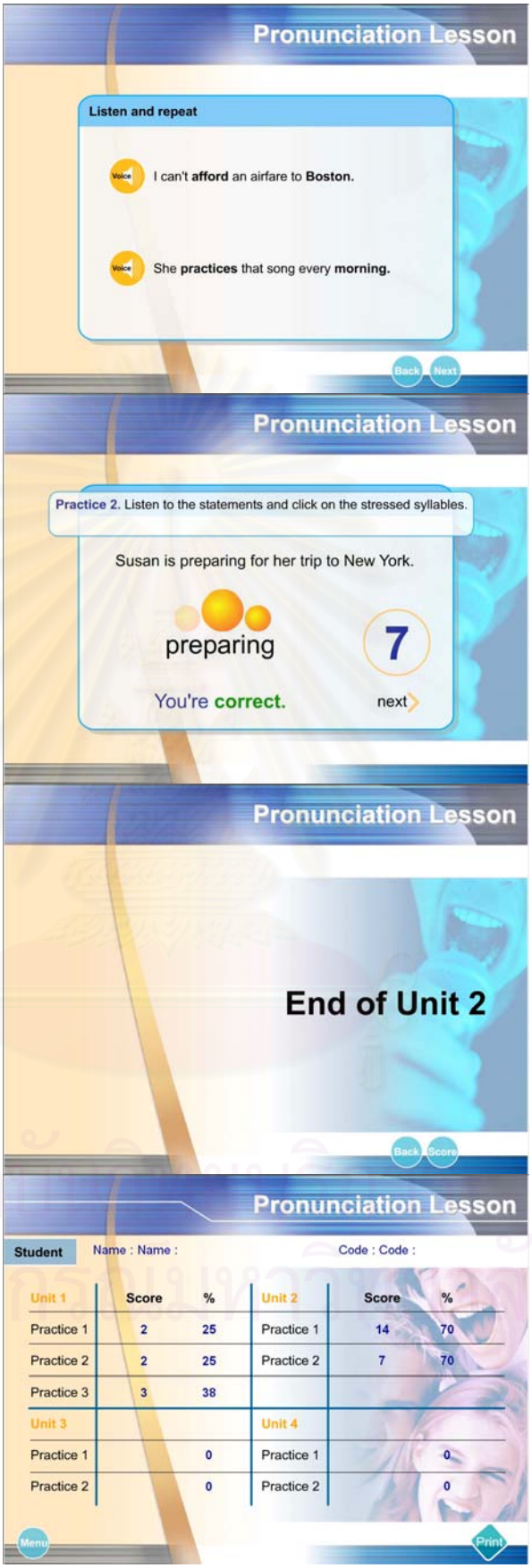
Appendix B : multimedia flowcharts

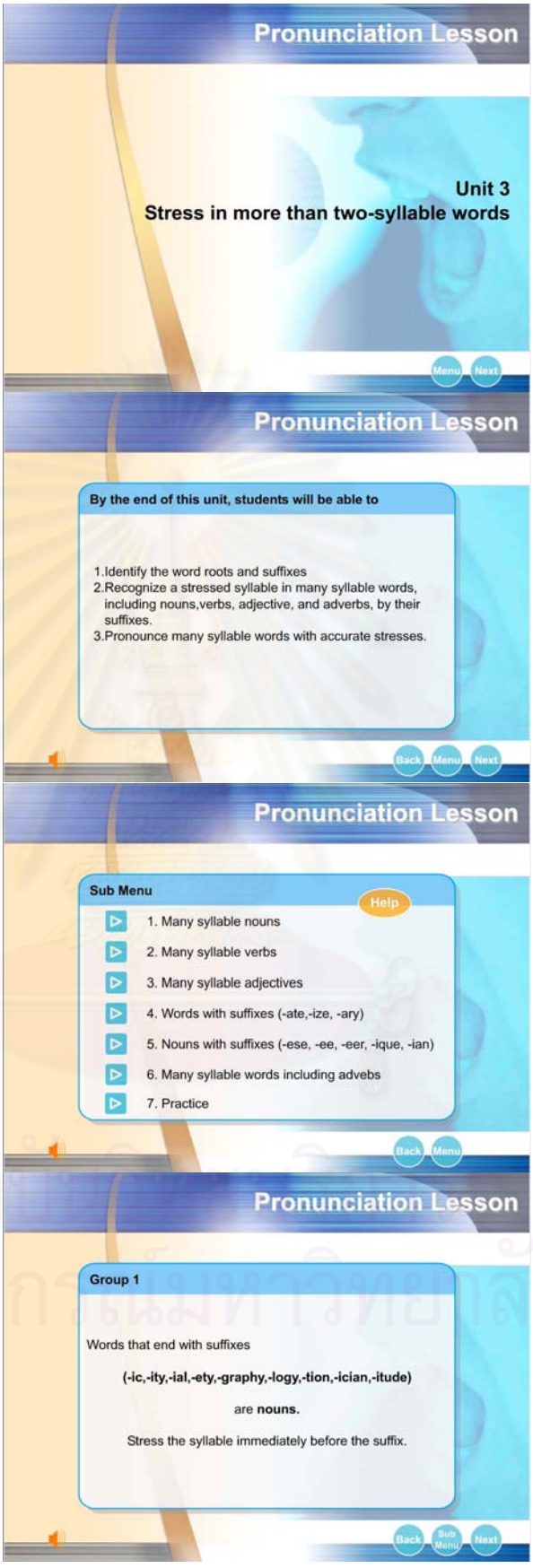

Pronunciation Lesson
Course Description
The course is designed to use rhythmic balls to help students remember stresses in words. The words which are presented in each lesson are commonly used in daily basis.
Back
Menu
Pronunciation Lesson
Course Instruction
This course is designed to facilitate students whose English speaking ability is considered novice to intermediate. The course is aimed at strengthen speaking ability in the area of stresses. Stresses, which are not found in the first language of the students, are main features of English language. Speaking English without stresses or with wrong stresses may cause difficulty and misunderstanding.
Menu
Next
Pronunciation Lesson
How to learn the lessons!
First, read the definition and rules presented in the unit.
Second, listen to the models given.
Next, practice by imitating the models given.
Then, complete exercises. The feedback is provided.
Finally, move on to the next lesson.
Menu
Pronunciation Lesson
Course Objectives
1. Students will be able to identify stressed and unstressed syllables accurately.
2. Students will be able to pronounce individual English words with an accurate stress.
3. Students will be able to read an English passage with a control of stresses in words.
Menu


Pronunciation Lesson
Practice 2. Listen. Then click on the stressed syllables.
Develop
1
You're correct.
next
Pronunciation Lesson
Practice 2. Listen. Then click on the stressed syllables.
Wonderful
2
You're wrong.
next
Pronunciation Lesson
Practice 2. Listen. Then click on the stressed syllables.
Responsibility
2
You're wrong.
next
Pronunciation Lesson
Student
Name :
Code :
Unit 1 Score % Unit 2 Score %
Practice 1 2 25 Practice 1 0
Practice 2 2 25 Practice 2 0
Practice 3 3 38
Unit 3 Unit 4
Practice 1 0 Practice 1 0
Practice 2 0 Practice 2 0
Menu
Print


Pronunciation Lesson
Unit 2
Stress in two-syllable nouns and verbs
Menu
Next
Pronunciation Lesson
By the end of this unit, students will be able to
1.Identify the part of speech of each word whether it is a noun or a verb.
2.Recognize a stressed syllable in two-syllable words, including nouns and verbs.
3.Pronounce given words with accurate stresses.
Back
Menu
Next
Pronunciation Lesson
Sab Menu
1. Word roots, prefixes, and suffixes
2. Two-syllable nouns
3. Two-syllable verbs
4.Practice
Back
Menu
Pronunciation Lesson
The word root is the center of a word, without prefixes and suffixes, and carries its basic meaning, such as care in careful,carefully, careless, and caring. All italics are suffixes that change the part of speech and the meaning. Care is a noun or a verb, careful is an adjective, carefully is an adverb, careless is an adjective, and caring is an adjective too.
Back
Sub Menu
Next


Pronunciation Lesson
More samples:
Aquarium
The root "aqua" means water.
Biology
The root "bio" means life.
Predict
The root "dict" means speak.
Back
Sub Menu
Next
Pronunciation Lesson
Listen and repeat
Chinese
Important
Develop
Development
Next
Pronunciation Lesson
Practice 2. Listen to the statements and click on the stressed syllables.
Students enjoy studing English.
English
1
You're correct.
next
Pronunciation Lesson
A prefix is a part of a word that is attached before the word root and changes the meaning of the word.
Prefixes can be grouped as following:
.Negative a-,dis-,il-, im-,in-,non-,un, mis-
.Size demi-,hemi-,semi-,uni-,bi-,tri-,dec-,cent-,poly-
.Time ante-,pre-,pro-,re-,post-
.Place ac-,ad-,ag-,an-,em-,en-,ex-,pro-
.Together or separate auto-,ab-,col-, com-,con-,syn-
Back
Sub Menu
Next


Pronunciation Lesson
Listen and repeat
I can't afford an airfare to Boston.
She practices that song every morning.
Back
Next
Pronunciation Lesson
Practice 2. Listen to the statements and click on the stressed syllables.
Susan is preparing for her trip to New York.
preparing
7
You're correct.
next
Pronunciation Lesson
End of Unit 2
Back
Score
Pronunciation Lesson
Student
Name : Name :
Code : Code :
Unit 1 Score % Unit 2 Score %
Practice 1 2 25 Practice 1 14 70
Practice 2 2 25 Practice 2 7 70
Practice 3 3 38
Unit 3 Unit 4
Practice 1 0 Practice 1 0
Practice 2 0 Practice 2 0
Menu
Print


Pronunciation Lesson
Unit 3
Stress in more than two-syllable words
Menu
Next
Pronunciation Lesson
By the end of this unit, students will be able to
1.Identify the word roots and suffixes
2.Recognize a stressed syllable in many syllable words, including nouns,verbs, adjective, and adverbs, by their suffixes.
3.Pronounce many syllable words with accurate stresses.
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Pronunciation Lesson
Sub Menu
Help
1. Many syllable nouns
2. Many syllable verbs
3. Many syllable adjectives
4. Words with suffixes (-ate,-ize, -ary)
5. Nouns with suffixes (-ese, -ee, -eer, -ique, -ian)
6. Many syllable words including advebs
7. Practice
Back
Menu
Pronunciation Lesson
Group 1
Words that end with suffixes
(-ic,-ity,-ial,-ety,-graphy,-logy,-tion,-ician,-itude)
are nouns.
Stress the syllable immediately before the suffix.
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Sub Menu
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Pronunciation Lesson
Listen and repeat
A.bi.li.ty
Con.ver.sa.tion
E.las.tic
Bi.o.lo.gy
Back
Sub Menu
Next
Pronunciation Lesson
Practice 2. Listen to the statements and click on the stressed syllable.
Every individual is unique.
individual
0
You're wrong.
next
Pronunciation Lesson
Practice 2. Listen to the statements and click on the stressed syllable.
Every individual is unique.
unique
0
Pronunciation Lesson
Group 2
Words that end with suffixes
(-ify)
are verbs.
Stress the syllable immediately before the suffix.
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Sub Menu
Next


Pronunciation Lesson
Listen and repeat
Every individual is unique.
Creativity is engaged in our society.
Back
Next


Pronunciation Lesson
Listen and repeat
The referee stops the game because it seems dangerous.
The flowers beautified her beautiful hair.
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Next


Pronunciation Lesson
End of Unit 3
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Score


Pronunciation Lesson
Student
Name : Name : Name :
Code : Code : Code :
Unit 1 Score % Unit 2 Score %
Practice 1 2 25 Practice 1 14 70
Practice 2 2 25 Practice 2 7 70
Practice 3 3 38
Unit 3 Unit 4
Practice 1 0 Practice 1 0
Practice 2 1 10 Practice 2 0
Menu
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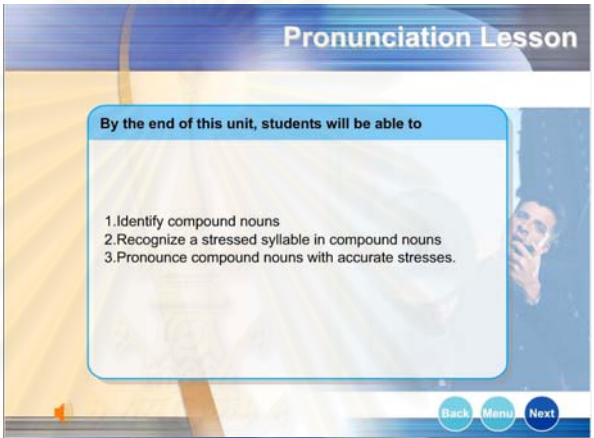
Pronunciation Lesson
Unit 4
Compound nouns
Menu
Next

Unit 4


Pronunciation Lesson
By the end of this unit, students will be able to
1.Identify compound nouns
2.Recognize a stressed syllable in compound nouns
3.Pronounce compound nouns with accurate stresses.
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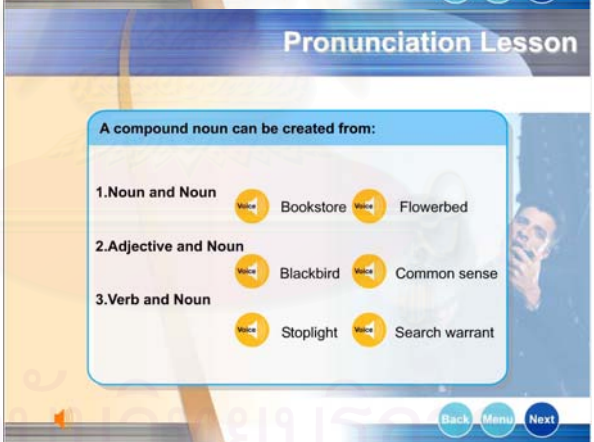
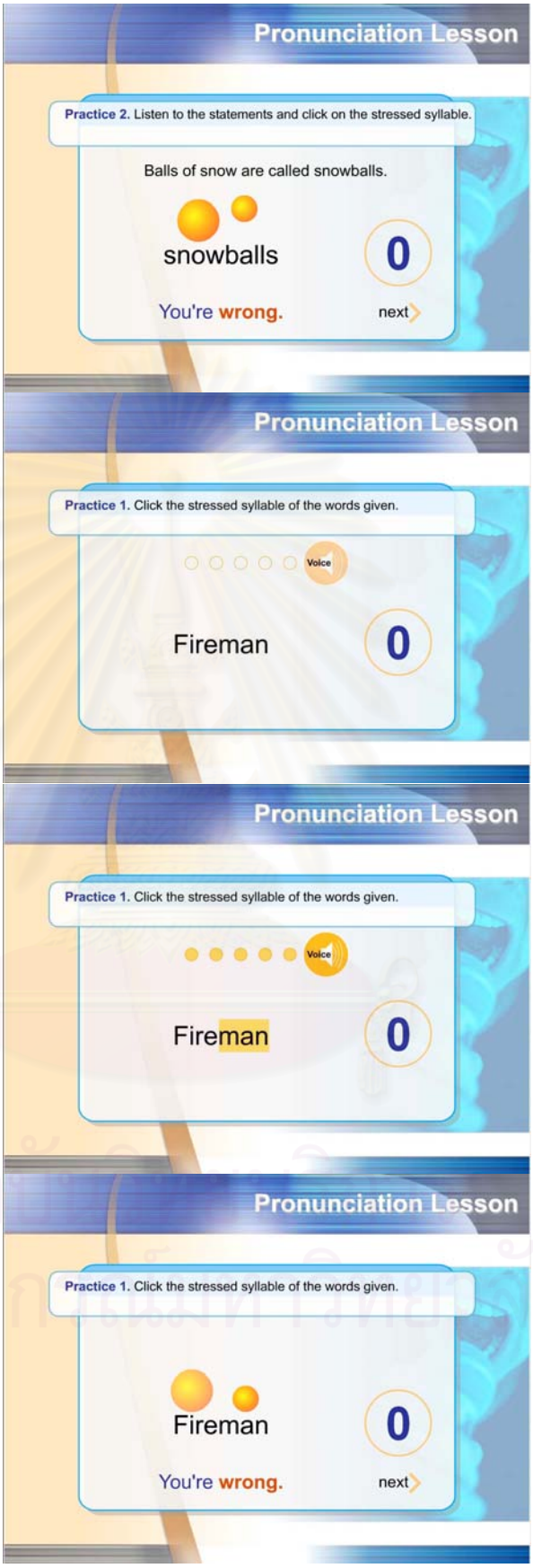
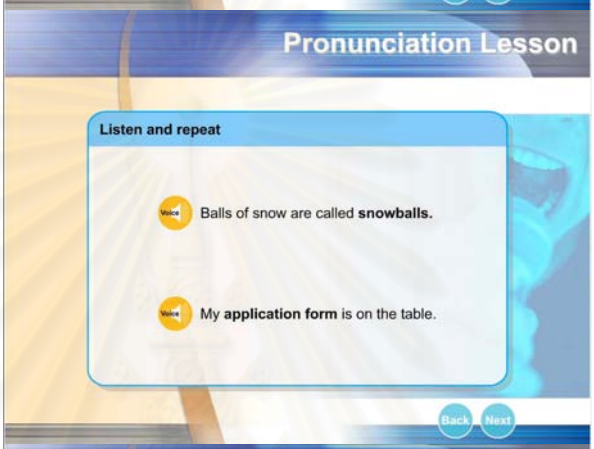
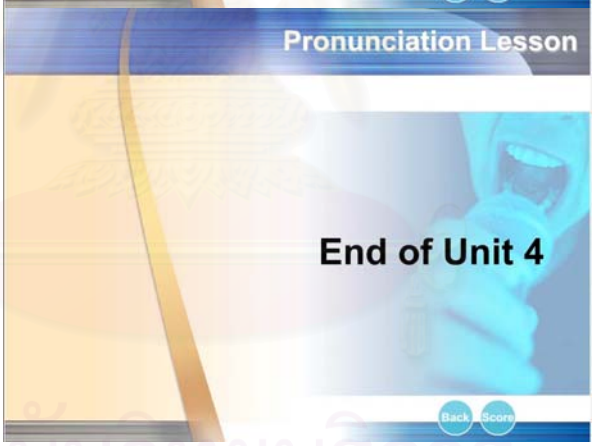

Pronunciation Lesson
A compound noun can be created from:
1.Noun and Noun
Bookstore
Flowerbed
2.Adjective and Noun
Blackbird
Common sense
3.Verb and Noun
Stoplight
Search warrant
Back
Menu
Next


Pronunciation Lesson
Practice 1. Click the stressed syllable of the words given.
Fireman
0
You're wrong.
next




Pronunciation Lesson
Listen and repeat
Fireman
Roommate
Popcorn
Greenhouse
Back
Next


Pronunciation Lesson
Listen and repeat
Balls of snow are called snowballs.
My application form is on the table.
Back
Next


Pronunciation Lesson
End of Unit 4
Back
Score


Pronunciation Lesson
Student
Name : Name : Name : Name :
Code : Code : Code : Code :
Unit 1 Score % Unit 2 Score %
Practice 1 2 25 Practice 1 14 70
Practice 2 2 25 Practice 2 7 70
Practice 3 3 38
Unit 3 Unit 4
Practice 1 0 Practice 1 0 0
Practice 2 1 10 Practice 2 3 75
Menu
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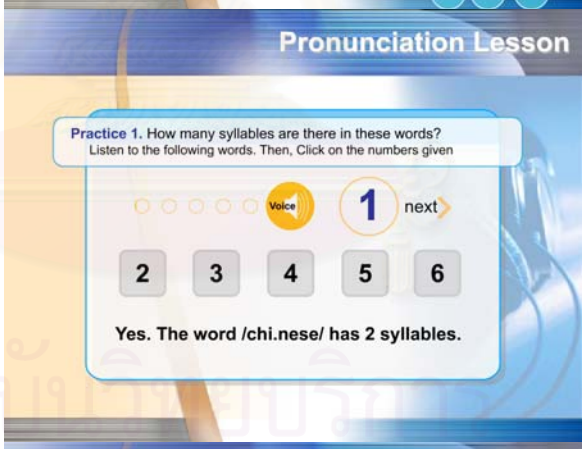
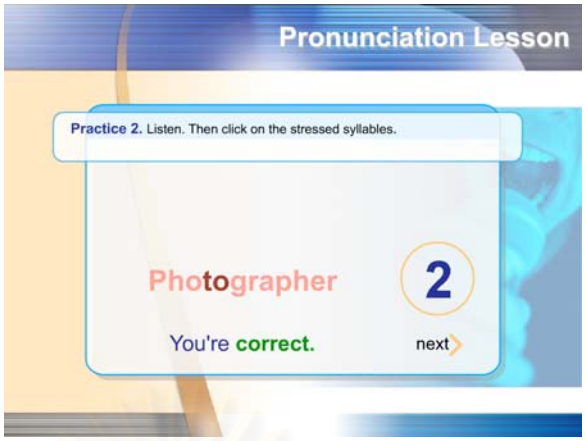
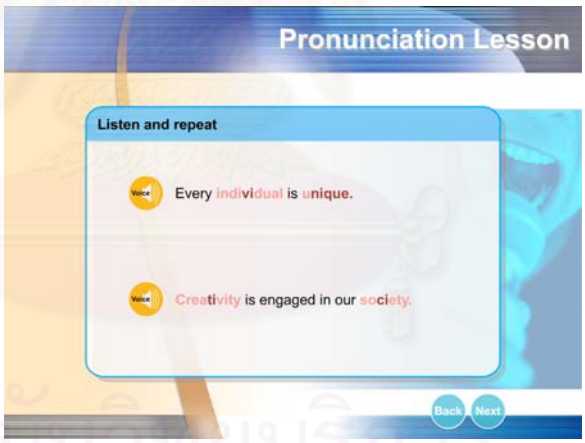
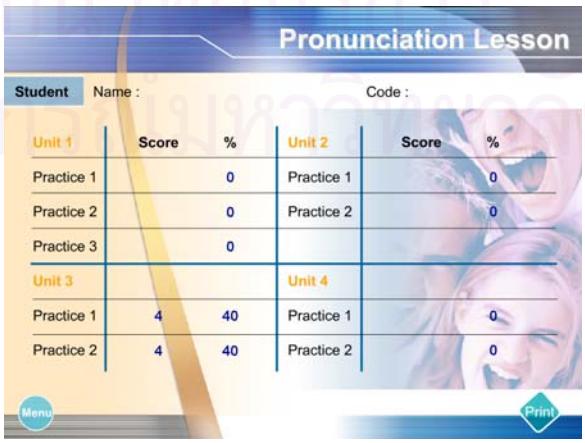
SAMPLE SCREENS OF THE COLOR-BAR MULTIMEDIA PRONUNCIATION LESSONS




Pronunciation Lesson
Practice 2. Listen. Then click on the stressed syllables.
Photographer
2
You're correct.
next


Pronunciation Lesson
Listen and repeat
I.den.ti.fy
Mag.ni.fy
Beau.ti.fy
Back
Sub Menu


Pronunciation Lesson
Listen and repeat
Every individual is unique.
Creativity is engaged in our society.
Back
Next


Pronunciation Lesson
Student
Name :
Code :
Unit 1 Score % Unit 2 Score %
Practice 1 0 Practice 1 0
Practice 2 0 Practice 2 0
Practice 3 0
Unit 3 Unit 4
Practice 1 4 40 Practice 1 0
Practice 2 4 40 Practice 2 0
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Appendix C : Oral pretest and posttest

My name is _____. I come from _____.
My native language is _____.

Part 1 Read the following words with appropriate word stresses

1. Afford
2. Building
3. Visualize
4. Newspaper
5. International
6. Whiten
7. Summer
8. Distribution
9. Responsibility
10. Prefer
11. Nature
12. Verify
13. Shareholder
14. Replay
15. Soften
16. Protect
17. Swimming suit
18. Intelligible
19. Individual
20. Individuality

Part 2 Read the following paragraph with appropriate word stresses

Learning to speak a foreign language fluently and without an accent isn't easy. In most educational systems, students spend many years studying grammatical rules, but they don't get much of a chance to speak. Arriving in a new country can be a frustrating experience. Although they may be able to read and write very well, they often find that they can't understand what people say to them. English is especially difficult because the pronunciation of words is not clearly shown by how they're written. But the major problem is being able to listen, think, and respond in another language at a natural speed. This takes time and practice.

Appendix D : Statement from Co-advisor

广 西 师 范 大 学

Guangxi Normal University

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April 28, 2003

I owe honor and pleasure to Chulalongkorn University, Thailand, for being offered the opportunity to direct Miss Chulaporn Kongkeo's PhD. dissertation. Now I am happy to see the successful completion of the dissertation , which is ready for evaluation by Evaluation Commission of Chulalongkorn University.

I am herein writing in comment on and approval of Miss Chulaporn Kongkeo's dissertation under the title of "Effects of Rhythmic Method in Multimedia Lessons and Learning Exposure Upon English Pronunciation Achievements of Thai and Chinese Undergraduates with Different Learning Styles".

Teaching English as a second language is taking a more and more important place in the university curriculum in non-English speaking countries around the world with the globalization of economy and education. The research project focuses on the teaching of English pronunciation with the help of multimedia technology which brings the students, both Thai and Chinese, to better learning exposure to real language situation and relatively standard pronunciation. Thai and Chinese students, though different in learning style, are benefited from the method under discussion as shown in the experiments, which will lead to better communication in the future.

The dissertation takes as its guiding line the government policy concerning English education, employs relevant modern linguistic theories and related psychological theories and experiences in TESL to support, is supplied with experiment data which are reliable, and puts forward some suggestions for future research which are really valuable and of practical significance to TESL in both Thailand and China.

广 西 师 范 大 学

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I, who sign under as co-advisor of Miss Chulapon Kongkeo, request approval of Miss Chulaporn Kongkeo's dissertation and conference of Doctor's degree to her in consideration of her accomplishment in the research project. I express my sincere thanks to Dr. Chawalert Lertchalolarn for his important advice, to the Thai experts who have ever help with her research, to the members on the Evaluation Commission of Chulalongkorn University for their valuable comments and suggestions. I also apologize for being absent due to reason known to all.

He Ruiyong, Professor and Advisor
Guangxi Normal University
Guilin
The People's Republic of China

Biography

Chulaporn Kongkeo graduated her bachelor from the faculty of Arts majoring in English of Chulalongkorn University, and her Master degree in TESOL with the GPA. 3.97 from Fairleigh Dickinson University in New Jersey in 1997. After she had finished her bachelor's degree, she served as a language and cross-cultural trainer and a coordinator at the US. Peace Corps, Thailand for three training programs. She has been working as an English instructor at Chulalongkorn University Language Institute since 1997 after she had graduated her Master's degree. She has a strong interest in teaching pronunciation as well as designing materials and activities to teach pronunciation and speaking.