The Effect of Multimedia Learning on the Third Grade of Thai Primary Pupils Achievement in Pronunciation Proficiency

Mathukorn Jingjit
Faculty of Humanities and Social Science
Yala Rajabhat University
133 Thesabal 3 Road, Amphor Muang, Yala Province
Thailand

Abstract

This study aims to obtain an understanding with regard to the effect of multimedia learning and pupils' characteristics on English pronunciation proficiency of the third grade of Thai primary pupils. A quasi-experiment is applied using one group pretest-posttest design combined with time series design, as well as data triangulation. The sample comprises 42 pupils of third grade of Municipal School 2 located at Hadyai, Songkla Province, Southern Thailand. The findings indicates that the multimedia learning significantly impact on the improvement of pupils' proficiency to pronounce /θ/, /ð/, /v/, /g/, /s/, /p/, /p/, /t/, /k/ consonant phonemes of English. The findinds implay that the policy makers and English teachers in Thai, together, are required to innovate the current English learning system, including facility development, multimedia program development, teachers' role reorientation, and parent involvement. The originality of this study might arise from the fact that the more insights as regards pronunciation proficiency in the context of Thai primary pupils has been urged by several researchers. Both the result and research methodology applied in this study was perceived to be useful for further researches and applications.

Keywords: Multimedia learning, Consonant phonemes, Thai primary pupils

1. Introduction

Learning English is an important matter for Thai pupils considering that current and future global communication commonly using English as a major international language (OEC, 2004). As is well known, recently a lot of local and global information is displayed in English, and such conditions also began to take place in Thailand (Pulapornnan, 2008). Considering the important of pronunciation in oral communication, Thai education basic curriculum set out that one important target of learning English is proficiency of pupils to pronounce English words (OBEC, 2008). It is based on the idea that English is used to communicate each other among individuals, and consequently, speaking is the main skill that must be mastered by Thai pupils to communicate orally. Thus, speaking is the language skills which should be taught first, before other language skills; and the first thing that must be considered to speak in English is the need for clear pronunciation (Lakorn, 2005).

Considering the important of pronunciation in oral communication, yet, up until now Thai pupils still encounter several problems with regard to English pronunciation proficiency. In general, most of Thai pupils are poor in English pronunciation proficiency and still not able to pronounce English words correctly (Muthukan, 2005). Phonological difference between English and their mother tongue causing the lack of third grade of Thai primary pupils in pronunciation proficiency (Bourjan, 2003). Moreover, Thai pupils who came from different schools often pronounce English words in different ways; as a result of differences in teaching style of their English teachers (Lakorn, 2005). One determinant of the pronunciation of English proficiency is Thai pupils themselves. Thai pupils are shy to speak a foreign language. They have low awareness of the importance to pronounce English words correctly (Muthukan, 2005).

In particular, most of Thai pupils still demonstrate lack of pronunciation proficiency in three consonant sounds; i.e. /p/, /t/ and /k/ sounds (Muthukan, 2005). The lack of Thai pupils in pronunciation proficiency also occurred in /š/, /č/, /v/, /θ/, /ŏ/ sounds (Lakorn, 2005).

It also found that Thai pupils are generally difficult to pronounce variety of consonant sounds, such as /g/, /v/, /θ/, /ŏ/, /z/, and /r /; both in the initial and the final position (Bourjan, 2003). Thai pupils mostly are also having middle and low level in term of their English background, computer literacy, and socioeconomic status. In fact, the three characteristics are potentially impact their academic achievement (Karadeniz, 2011; Tomul & Celik, 2009).

Given the important of multimedia learning to promote pupils' proficiency to pronounce the English words, yet, there is still lack of multimedia program developed specifically addresses to English subject for third grade of Thai primary pupils and applicable to be applied in a certain semester in accordance with the learning objectives has been set out.

The main purpose of this study is to investigate the effects of the multimedia learning on the achievement in pronunciation proficiency of pupils in third grade of Thai primary schools. In addition, it intended to examine the effects of pupils' English background, computer literacy, socioeconomic status on the pronunciation proficiency of pupils in third grade of Thai primary schools. It is hoped that the results will provide a valuable input for the policy maker and English teachers in promoting the English learning process quality, as well as to extent the current knowledge of multimedia learning implementation in educational field for young learner.

The rest of the paper consists of three sections which are organized as follows. It begins with an explanation concerning research design and methodology of the empirical study. This was then followed by a discussion regarding the phenomena observed in the study. Finally, conclusion based on the finding and directions for future research was provided in the last section.

2. Theoretical Conceptual

2.1 Multimedia learning concepts

In recent years, multimedia computers have created many new possibilities for improving educational qualities in school. Besides providing a variety of ways to deliver the content of a subject, multimedia computers also create a pupil-centred learning environment which can increase a pupil's motivation. In multimedia learning environment, the learning materials will be accompanied by the use of multimedia to increase the passion for learning and retaining the pupils' attention (Sorden, 2005).

Following Austin (2009), multimedia learning can be interpreted as a computer-based system to deliver an integrated learning material in learning processes. The term "computer-based" refers to a learning process that uses a computer to deliver the learning materials, while the term "integrated" refers to a learning process that displays text, image, and audio materials simultaneously. This is similar Dutke and Rinck (2006), who stated that multimedia is generally defined as the use of a computer to display and combine various media (such as text, images, and audio), equipped with several tools to allow the user to navigate, interact and communicate.

Another concept is conveyed by Mayer (2003), who addressed that multimedia learning refers to a learning process in which the learning materials are delivered by using multi modes, such as words and pictorial modes. The word mode means that learning materials can be delivered by using oral presentation or in printed format. The picture mode means that learning material can be delivered by using pictures, animations, or video presentations.

Meanwhile, Moreno and Valdez (2005) points out that multimedia learning refers to scientific explanations using learning media in the classroom. Potentially, the implementation of multimedia learning can promote meaningful learning. This can be achieved if the learning material is conveyed to the pupils through a variety of instructional tools, and interactivity in the pupils' learning activities. This is in line with Kalyuga (2009) who stated that in the context of teaching and learning processes, teachers are required to be able to create effective learning environments using words and picture modes to promote learning processes.

Based on their research, Mayer et al. (2001) found that effective multimedia learning is able to improve pupils' understanding. The promise that multimedia facilitates improvement in the learning processes which has led to the increasing use of a computer as an instructional media in learning. Referring to Siskos et al. (2005), the interactive nature of multimedia learning is able to increase the pupils' interest. In addition, it provides encouragement for young pupils in the processes of learning. They also argue that young pupils will pay more attention in the processes of learning, when the teachers use animation and narration as the medium of instruction.

By using recent computer technology, it is possible to combine presentation in verbal modes and nonverbal modes in a single device. In addition, the use of multimedia technology may create a learning environment which enables the pupils to see models of a complex system using computer animation programmes. However, most multimedia technology has been developed on the basis of the technology, rather than on the basis of pedagogical principles. This means that the design of multimedia learning is still largely based on intuitive factors rather than on pedagogically empirical factors (Moreno & Mayer, 1999).

2.2 Cognitive processes in multimedia learning

Learning may be defined as a process to encode or store knowledge or skills into the pupils' long term memory. To be successful, the processes should be created in such a way that the knowledge or skills may be recalled and applied at a later time on demand – easily and in an automatic manner. This is based on the assumption that knowledge or skills that have been learnt is successfully encoded into the pupils' long term memory and can be recalled and applied later (Cooper, 1998).

To allow it to be encoded in the long-term memory, the incoming information must first be processed by ones working memory. In certain cases, if ones working memory is not able to processes the incoming information and sends the results to the long-term memory, it means that the learning processes will be ineffective. This has important implications in the development of instructional design, as a working memory's limitations can hinder the learning processes (Cooper, 1998).

In the multimedia learning environment, pupils are involved in three important cognitive processes as follows (Mayer & Moreno, 2002). First is the selecting process. When the incoming information is in verbal form, this process is applied to produce the text image. Meanwhile, if the incoming information is a visual image, this process is applied to produce an image base. Second is the organizing process. This process is applied to the word base to produce a verbal-based model and applied to the image base to produce a visual-based model. Third is the integrating process. This process occurs when the pupils develop an appropriate relationship between events in the verbal-based model and visual-based model.

Following Mayer (2002), the processes of cognitive a learning process conducted using multimedia comprises of two channel. The upper section of the model represents the audio pathway while the lower section represents the visual pathway. Verbal information will enter into the cognitive system through the ear sensor, while pictorial information will enter into the cognitive system through the eye sensor. The two kinds of information will be processed by elements of the working memory. This model by Mayer shows that the process of knowledge construction comprises of three kinds of cognitive processes, called the verbal model, the pictorial model, and the integrative model.

The verbal model is the element of a working memory that serves to processes and manages verbal information entering the system through the ear sensor. The pictorial model is the element of a working memory that serves to processes and to manage pictorial information that is entering the system through eye sensors. The integrating model is the element of the working memory that serves to integrate information derived from a verbal model and picture model, with prior knowledge that has been stored previously in the long-term memory.

Furthermore, Mayer (2002) describes that initially, the incoming verbal and pictorial information will be processed in the working memory. Then, it will be transferred and integrated into the long-term memory. Nevertheless, since a human's working memory system is limited in its capacity, new knowledge that has been obtained and processed by the elements in the working memory should be stored or integrated into the long-term memory, otherwise the new knowledge or information that is already in the working memory will be lost.

A similar concept was conveyed by Cooper (1998), who stated that a learning process can be interpreted as information that is transferred from a teacher to the pupils. This process consists of three stages: sensory memory, short-term memory, and long-term memory processes. In the first processes, the incoming information which comes from the environment will be captured by ones sensory memory. Next, the information considered irrelevant and unnecessary will be discarded, while relevant and important information will be delivered to the short-term memory. As short-term memory receives the information from the sensory memory, it will process the information into a meaningful and easier form which can be memorized a lot quicker. Pictures and symbols are usually memorized this way. The irrelevant or highly complicated information will be splat as oblivious memory, while the relevant information will be delivered to the long-term memory. In the long term memory, novel information delivered by the short-term memory will be stored and constructed in accordance with the prior associated information.

In other words, this storing process is conducted according to the information type and category so that it can be easily stored and recalled to the short-term memory. As short-term memory, it also experiences the oblivious processes, which is caused by the obsolescence or disorder occurrence.

According to Kluit (2006), the implementation of multimedia learning and cognitive load theory are closely related. This is based on the assumption that the elements in a working memory have a limited cognitive capacity, either in the processing or the storage of the cognitive load. Thus, if a process of learning requires a large cognitive load, the pupil's learning processes will be hampered. Furthermore, Kluit states that the main purpose of implementing the cognitive load theory in a learning process is to increase the potential of meaningful learning. This purpose can be achieved by combining visual and verbal information in the working memory element. The utilization of the visual and verbal pathways in the working memory will provide pupils with an opportunity to create meanings between them and to increase the utilization of the long-term memory.

2.3 Multimedia learning and pronunciation learning

Prior studies have proposed that multimedia learning is able to promote the learning process outcomes. Following to Mayer et al. (2001), multimedia learning implementation is able to improve pupils' understanding with regard to the subject being studying. Meanwhile, Siskos et al. (2005) proposed that the interactive nature of multimedia learning is able to increase the pupils' interest, as well as provides encouragement to young pupils in the process of learning. They also argue that young pupils will pay more attention in the process of learning, when the teachers use animations and narration as the media of instruction.

Hismanoglu and Hismanoglu (2011) proposed that the computer-based pronunciation learning programme is helpful for the pupils as well as the teachers. From the pupils' viewpoint, it will help pupils study independently and give them unlimited options as to select what lesson to study, and how often they wish to repeat the lesson. Meanwhile, the teachers can get benefits from the implementation of the programme to promote the pronunciation learning process in their class. In other words, it can give pupils drilling practice, while at the same time it can replace the teachers' voice which were considered as inefficient and monotonous.

Following the discussion, it can be drawn that multimedia learning could be implemented to improve the third grade of Thai primary pupils' achievement in pronunciation proficiency.

3. Research methodology

3.1 Participants

Participants of this study consist of 42 pupils derived from the third grade of Municipal School 2 located at Hatyai district, Songkhla province, southern Thailand. The participants had ages between 8 and 10 years old. Table 1 presents the characteristics of participants being investigated in this study. As can been seen from Table 1, majority of the participants had good level in English background, with the middle and level in computer literacy, and have the middle and low level in socioeconomic status.

3.2 Research design

This study applied a mixed method design encompassing *Quan + Qual format* design (Richard, 2006). As regards *quantitative format*, this study implemented *one group pretest-posttest design* and combined it with *time series design*. To achieve a better understanding regarding the investigated phenomena, this study performed *qualitative format* using data triangulation with four pupils and four English teachers of Thai primary school as the interviewees (Lacey & Luff, 2001). Table 2 present the experimental design applied in this study

Table 1. Characteristics of the participants

Characteristics	Categories	Frequency	%
English background	Low	4	9.5
	Middle	12	28.6
	High	26	61.9
Computer literacy	Low	16	38.1
	Middle	23	54.8
	High	3	7.1
Socioeconomic status	Low	9	21.4
	Middle	30	71.5
	High	3	7.1

Table 2.One Group Pretest-postest Design with Time Series Test Applied in this Study

Pretest	Pronunciation learning								Posttest
	L1	L2	L3	L4	L5	L6	L7	L8	
	T1 T2 T3	T1 T2 T3	T1 T2 T3	T1 T2 T3	T1 T2 T3	T1 T2 T3	T1 T2 T3	T1 T2 T3	

Remarks:

1. L1 – L8 refers to 8 lessons of pronunciation learning conveyed along the experimental period
2. T1 – T3 refers to 3 pronunciation series tests with corresponding to each lesson of pronunciation learning

3.3 Research instruments

The learning materials for the experimental purpose were developed in accordance with the two following consideration. Firstly, the analysis of the English subject and its objectives were derived from Thai basic Curriculum for English, and secondly, the analysis of the existing problems encountered by Thai pupils with regard to their vocabulary. At the end, a total 52 word items were selected to be delivered during the experimental periods. The items of pronunciation learning were derived from two English books recommended by Thai Ministry of Education in 2008.

A researcher-design multimedia program was developed and implemented in the experimental. It was developed and conveyed using computer and be stored or packed in a CD. Considering Mayer, et al. (2002), four factors were taken into account in developing the multimedia program. Firstly, the materials were delivered through several learning units or modules in order to reduce the complexity and difficulty level the materials. It is hoped that the internal cognitive loads faced by pupils would be reduced. Secondly, the program was incorporated by a proper instruction to reduce the level of pupils' external cognitive load. To that end, the program was incorporated by written text and spoken instructions. Thirdly, the pictures and texts have to be placed in such a way to prevent pupils split their attention between pictures and texts. This was intended to reduce external cognitive load faced by pupils. Finally, the appearance of the program had to be designed as attractive as possible to increase pupils' interest to learn, as well as their motivation to be engaged in the learning process.

4. Results and Discussion

4.1 Pretest and Posttest

To assess the effectiveness of multimedia learning in improving pupils' pronunciation proficiency, a pretest and posttest of pronunciation was necessary to perform to measure their proficiency prior to and following the learning programme. The pretest and posttest were carried out by recording pupils' voice using a digital voice recorder. It consisted of 32 words those pupils had to pronounce associated with /θ/, /ð/, /v/, /g/, /s/, /p/, /p/, /t/, /k/ phonemes. If they could pronounce a word correctly, they would be awarded 1 point; otherwise they would get 0. Figure 1 below depicts the scores of the pretest and postest. As depicted in Figure 1, prior to learning using the multimedia, on average the pupils were only able to pronounce 11.31 words or 35.34% of the targeted words. Following the experiment period, on average the pupils were able to pronounce 20.58 words or 64.31 % of the targeted words.

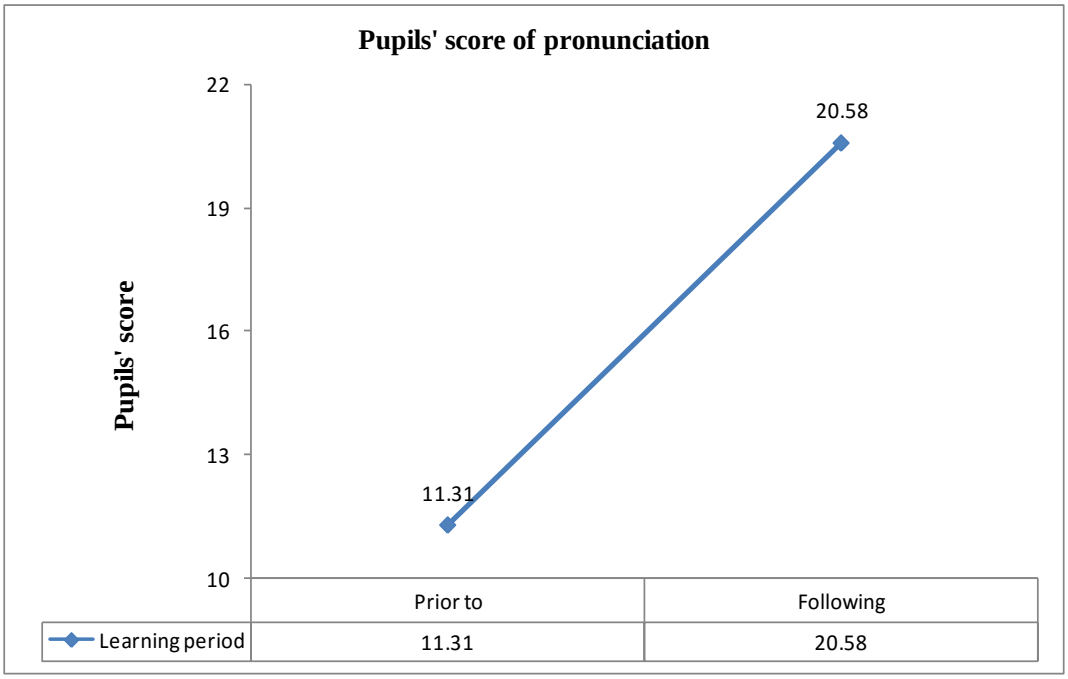

Figure 1. Pretest and postest scores

As regards the effect of multimedia learning on pronunciation proficiency, this study found that prior to the experimental; pupils mostly are lack of proficiency to pronounce the English words. This finding is similar to that of Bourjan (2003) who proposed that most of Thai pupils still encounter many pronunciation problems. Bourjan states that some pupils were able to pronounce correctly when they were in the classroom, and they could repeat the words following the teacher, but soon after they were left the class they would have lost this proficiency.
Another reason for the low proficiency of the pupils to pronounce English words is the influence of their mother tongue. Because the Thai language is a tonal language, changing the tone in Thai pronunciation would affect the meaning and the parts of speech. When speaking English, Thai pupils commonly tend to ignore placing the right stress in the right position. In addition, they are so accustomed to using sound in their mother tongue to replace certain English sounds that they cannot pronounce them clearly (Bourjan, 2000; Lakorn, 2005). In fact, according to the basic educational curriculum, English class is offered once or twice a week, which amounts to 120 minutes within a 20 week semester.

Following to Kanchana (2005), the three following arguments partly explain why the pupils cannot pronounce English words correctly. First, the teaching method applied during the learning periods was dominated by dictionary-based translation activities. Second, in Thailand, English is rarely used for daily life communication which means outside the class; pupils use the Thai language in their communication. Third, Thai pupils rarely have a chance to speak English in the classroom. They spend their time listening passively to the teacher.

After the pupils were engaged in the learning programme, pupils' pronunciation proficiency improved compared to the previous situation. This was evidenced by the fact that they could pronounce more words in the posttest (82.12% higher than the result prior to the learning programme). The *t-test* provided the evidence that pupils' pronunciation proficiency following the learning programme was significantly higher than their pronunciation proficiency prior to the learning programme. In other words, English learning through multimedia is able to increase the achievement in the pronunciation proficiency of third grade of Thai primary pupils.

4.2 Implication

The findings have several implications. One of which is the promise that multimedia learning facilitate improvement of pronunciation proficiency has led to the increasing use of computer as instructional media for English learning in Thai primary school. As noted by Hua (2006), currently technology development has enabled computers to be applied in pronunciation learning. The computer-based pronunciation learning programme would provide the pupils with many options and opportunities to study and review any lesson of the learning materials contained in the programme and they are able to get further assistance through the programme.

In term of the computer literacy, Kerka et al. (2009) stated that in the current digital format era, Teachers who are required to prepare pupils to achieve higher academic standards need to continue into higher education or meet the demands of the workplace.

This in line with Lin (2009), who emphasized there should be a reform programme to improve English pronunciation teaching and learning which so far have not shown to provide effective results, especially in the context of ELL pupils. Moreover, Li argued that in a pronunciation test, several criteria can be used to determine pupils' pronunciation proficiency, such as correct pronunciation, correct intonation, pressure appropriateness, and rhythm.

5. Conclusion

Potentially, the implementation of multimedia learning can promote pupils' pronunciation proficiency of third grade of Thai primary pupils. This can be achieved if the learning material is conveyed to the pupils through a variety of instructional tools, and interactivity in the learning activities. Consequently, Thai English teachers are required to be able to create effective learning environments using the integrated modes to promote learning process. As proposed by Siskos et al. (2005), the interactive nature of multimedia learning is able to increase the pupils' interest. In addition, it provides encouragement to young pupils in the process of learning. They also argue that young pupils will pay more attention in the process of learning, when the teachers use animations and narration as the media of instruction. As noted by Gilbert (2008), ELL pupils generally ignore the pronunciation when they learn new word. Such conditions would hinder the pupils to recognize words in spoken language. As suggested by Hismanoglu (2006), given that pronunciation proficiency is an important component of pupils' competence in oral communication; the English teachers are required to updating their knowledge related to learning objectives and learning model. They should also be able to establish appropriate pronunciations of words when they are teaching pronunciation skills to the pupils.

References

Bourjan, Thuma (2003): Problem on Stress in English Pronunciation of Mathayomsuksa Six Students, *Retrieved on August 16, 2014, from http://www.mahasarakam.ac.th*

Demir, E. C. (2009): Factors influencing the academic achievement of the Turkish urban poor. *International Journal of Educational Development, 29*(1), 17-29

Gilbert, B. J. (2008): *Teaching pronunciation using the prosody pyramid.* New York: Cambridge University Press.

Greenman, E. et al. (2011): Neighborhood characteristics, parental practices and children's math achievement in elementary school, *Social Science Research, Article in Press, [Corrected Proof], Available online on May 05, 2011*.

Hismanoglu, M. (2006): Current perspectives on pronunciation learning and teaching. *Journal of Language and Linguistic Studies*, *2*, 1-10.

Karadeniz, S. (2011): Effects of gender and test anxiety on student achievement in mobile based assessment, *Procedia Social and Behavioral Sciences, 15*, 3173-3178.

Kerka, S. et al. (2003): Multiple literacy - a compilation for adult educators, Educational Resource Information Center Publication, *retrieved on March 16, 2011 from http://www.eric.edu.gov*

Lakorn, Supaporn (2005): The Effectiveness of Using a Rotation Technique to Improve Students' English Pronunciation, *Retrieved on August 14, 2014, from http://www.mahasarakam.ac.th*

Lee, W. William and Owen, L. Diana (2004): *Multimedia-Based Instructional Design,* John Wiley & Sons Inc, New York

Lin, Huang Yi (2009): Evaluation of an English pronunciation test designed for the EFL teacher students in a Chinese college, *US-China Foreign Language, 7 (7), 17-24*

Lurdes, M. & Paula, V. (2009): Do inequalities in parents' education play an important role in PISA students' mathematics achievement test score disparities? *Economics of Education Review, 29*(6), 1016-1033.

Mayer, R. E., (2003). The promise of multimedia learning: Using the same instructional design methods across different media, *Learning and Instruction 13*, 125-139.

Mayer, R. E., et al. (2001): Cognitive constraints on multimedia learning: When presenting more material results in less understanding. *Journal of Educational Psychology, 93*(1), 187-198.

Moreno, R. & Valdez, A. (2005). Cognitive load and learning effects of having students organize pictures and words in multimedia environments: The role of student interactivity and feedback. *Educational Technology, Research and Development, 53*(3), 35-46.

Muthukan, Kanchana (2005): The Use of Dialog Journal Technique to Improve Students' English Pronunciation, *Retrieved on August 16, 2014, from http://www.mahasarakam.ac.th*

Nowicki, Ursula et al. (2001): Teaching pronunciation: A handbook for teachers and trainers. *Retrieved on January 17, 2014 from http://www.cde.state.co.us*

OBEC - Office of the Basic Education Commission. (2008): The basic education core curriculum, Office of the Basic Education Commission, Thailand Ministry of Education. *Retrieved on January 17, 2014 from http://www.act.ac.th*

OEC - Office of the Education Council. (2004): Education in Thailand, Office of the Education Council, Ministry of Education, Royal Thai Government. *Retrieved on March 2, 2014 from http://www.moe.go.th*

OECD (2005): Learning for tomorrow's world first results from PISA 2003. (No.9264007245), *OECD, Paris.*

Pulapornnan, Thitaree (2008): The Use of Task-based Lessons with a Focus on Demonstrative Actions in Teaching English Vocabulary to Beginners, *Retrieved on August 19, 2014, from http://www. mahasarakam.ac.th*

Siskos, Apostolos. et al. (2005): Effects of multimedia computer-assisted instruction (MCAI) on academic achievement in physical education of Greek primary students. *Interactive Educational Multimedia, 10*, 61-77.

Thompson, A. Ross and Zamboanga, L. Byron (2004): Academic Aptitude and Prior Knowledge as Predictors of Student Achievement in Introduction to Psychology, *Journal of Educational Psychology*, 96 (4), 778–784

Tomul, E. and Celik, Kazim. (2009): The relationship between the students' academic achievement and their socioeconomic level: Cross regional comparison. *Procedia Social and Behavioral Sciences 1*, 1199–1204.

UNESCO (2008): Towards information literacy indicators, Retrieved on February 11, 2011, from http://www.uis.unesco.org

Unsworth, L. (2001). Teaching multiliteracies across the curriculum: Changing contexts of text and image in classroom practice. *Retrieved on February 14, 2011, from www.openup.co.uk*

Voithofer, R. & Winterwood, F. (2010). Articulating and contextualizing multiple literacies in an urban setting. *Urban Education, 45*(5), 687–707

Wiersma, W. & Jurs, G. S. (2005): *Research methods in education: An introduction.* NJ: Pearson Education

Weymer, A. Richard (2002): Factors Affecting Students' Performance in Sixth Grade Modular Technology Education, *Journal of Technology Education, 13 (2), 34-47*