THE EFFECT OF JIGSAW II TECHNIQUE ON READING COMPREHENSION OF MATTAYOM SUKSA 1 STUDENTS

A MASTER'S PROJECT

BY

DARARAT PROM-D

Presented in Partial Fulfillment of the Requirements for the

Master of Arts Degree in Teaching English as a Foreign Language

at Srinakharinwirot University

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AN ABSTRACT

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Dararat Prom-D. (2012). *The Effect of Jigsaw II Technique on Reading Comprehension of Mattayom Suksa 1 Students*. Master's Project, M.A. (Teaching English as a Foreign Language). Bangkok: Graduate School, Srinakharinwirot University. Project Advisor: Dr. Prapaipan Aimchoo.

The purpose of this study was to compare Mattayom Suksa 1 students' achievement on reading comprehension consisting of four sub-skills before and after being taught by using jigsaw II technique. The participants were 25 students, selected by convenience sampling, from students who volunteered to stay after school until six PM. They were taught reading comprehension that focused on four sub-skills; reading for main idea, reading for detail, drawing inference, and differentiating between fact and opinion, by using Jigsaw II technique. Jigsaw II technique involves the process of activity that includes five major steps which are 1) reading, 2) expert-group discussion, 3) team report 4) test, and 5) team recognition. The participants took the pretest and the post-test on reading comprehension that covered all four sub-skills. The scores on pretest and post-test were analyzed by mean and standard deviation (S.D.). The t-test dependent was used to check if the mean scores of pretest and post-test were significantly different in reading comprehension after learning by using jigsaw II technique. The findings indicated that reading for main idea and drawing inference were significantly higher at the .05 level. But reading for detail and differentiating between fact and opinion were not significantly higher at the .05 level. The results revealed that the reading comprehension sub-skill best developed by jigsaw II technique was drawing inference. However, the overall effect on Mattayom Suksa 1 students' achievement on reading comprehension was significantly higher after being taught by using jigsaw II technique at the .05 level.

ผลการใช้เทคนิคการสอนแบบปริศนาความรู้ต่อความเข้าใจในการอ่าน ของนักเรียนชั้นมัธยมศึกษาปีที่ 1

บทคัดย่อ

ของ

ดารารัตน์ พรหมดี

เสนอต่อบัณฑิตวิทยาลัย มหาวิทยาลัยศรีนครินทรวิโรฒ เพื่อเป็นส่วนหนึ่งของการศึกษา
ตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาการสอนภาษาอังกฤษในฐานะภาษาต่างประเทศ
มิถุนายน 2555

ดารารัตน์ พรหมดี. (2555). *ผลการใช้เทคนิคการสอนแบบปริศนาความรู้ต่อความเข้าใจในการอ่านของนักเรียนชั้นมัธยมศึกษาปีที่ 1*. สารนิพนธ์ ศศ.ม. (การสอนภาษาอังกฤษในฐานะภาษาต่างประเทศ). กรุงเทพฯ: บัณฑิตวิทยาลัย มหาวิทยาลัยศรีนครินทรวิโรฒ. อาจารย์ที่ปรึกษาสารนิพนธ์: ดร. ประไพพรรณ เอมชู.

การศึกษาค้นคว้าครั้งนี้ มีจุดมุ่งหมายเพื่อศึกษาเปรียบเทียบผลสัมฤทธิ์ด้านการอ่านเพื่อความเข้าใจซึ่งประกอบด้วย 4 ทักษะ ของนักเรียนชั้นมัธยมศึกษาปีที่ 1 ก่อนและหลังการสอนโดยใช้เทคนิคแบบปริศนาความรู้ กลุ่มตัวอย่างเป็นนักเรียนชั้นมัธยมศึกษาปีที่ 1 จำนวน 25 คน ที่ได้จากการเลือกตามสะดวก (convenience sampling) กลุ่มตัวอย่างได้รับการสอนอ่านโดยเน้น 4 ทักษะของการอ่านเพื่อความเข้าใจ ได้แก่ การอ่านเพื่อหาใจความสำคัญ การอ่านเพื่อหารายละเอียด การอนุมาน และการแยกแยะข้อเท็จจริงและความคิดเห็น โดยใช้เทคนิคการสอนแบบปริศนาความรู้ ซึ่งประกอบด้วยกิจกรรม 5 ขั้นตอน ได้แก่ ขั้นที่ 1 reading ขั้นที่ 2 expert-group discussion ขั้นที่ 3 team report ขั้นที่ 4 test และขั้นที่ 5 team recognition เครื่องมือที่ใช้ในการศึกษาค้นคว้าคือ แบบทดสอบก่อนเรียน-หลังเรียนวัดการอ่านเพื่อความเข้าใจ วิเคราะห์คะแนนก่อนเรียน-หลังเรียนโดยใช้ค่าเฉลี่ยและส่วนเบี่ยงเบนมาตรฐาน เปรียบเทียบข้อมูลคะแนนก่อนเรียน-หลังเรียนโดยใช้ t-test dependent

ผลการศึกษาค้นคว้าพบว่า คะแนนเฉลี่ยการสอบหลังเรียนของการอ่านเพื่อหาใจความสำคัญ และการอนุมาน ของนักเรียนสูงขึ้นอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 ส่วนคะแนนเฉลี่ยการสอบหลังเรียนของการอ่านเพื่อหารายละเอียด และการแยกแยะข้อเท็จจริงและความคิดเห็นของนักเรียนสูงขึ้นเพียงเล็กน้อย จึงไม่มีนัยสำคัญทางสถิติที่ระดับ .05 และจากทั้ง 4 ทักษะ พบว่าคะแนนเฉลี่ยการสอบหลังเรียนของการอนุมานสูงที่สุด หลังจากได้รับการสอบแบบปริศนาความรู้ นอกจากนั้นยังพบว่า คะแนนเฉลี่ยโดยรวมทั้ง 4 ทักษะ ของการสอบหลังเรียนของนักเรียนสูงขึ้นอย่างมีนัยสำคัญทางสถิติที่ระดับ .05 หลังจากได้รับการสอบแบบปริศนาความรู้

The Master's Project Advisor, Chair of Teaching English as a Foreign Language Program, and Oral Defense Committee have approved this Master's Project *The Effect of Jigsaw II Technique on Reading Comprehension of Mattayom Suksa 1 Students* by Dararat Prom-D as partial fulfillment of the requirements for the Master of Arts degree in Teaching English as a Foreign Language of Srinakharinwirot University.

Master's Project Advisor

.....

(Dr. Prapaipan Aimchoo)

Chair of the Master of Arts Degree in Teaching English as a Foreign Language

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(Dr. Anchalee Jansem)

Oral Defense Committee

..... Chair

(Dr. Prapaipan Aimchoo)

..... Committee

(Associate Professor Dr. Nitaya Suksaeresup)

..... Committee

(Assistant Professor Nattha Kaewcha)

The Master's Project has been approved as partial fulfillment of the requirements for the Master of Arts degree in Teaching English as a Foreign Language of Srinakharinwirot University.

..... Dean of the Faculty of Humanities

(Dr. Wanee Aujsatid)

June…..…, 2012

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Dararat Prom-D

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CHAPTER I

INTRODUCTION

Background

In today's global society, learning English has become more essential in daily life. English serves as an important tool for communication in all aspects of life such as education and work. Thus, it is necessary to create understanding among different cultures and visions of a world community. In Thailand, English is taught as a foreign language with the purposes of enhancing communication and education in order to participate more actively in the global society. To communicate effectively and use the language efficiently, Thai learners need to be fluent in all four language skills, which are listening, speaking, reading, and writing. English has been part of the national curriculum since 1895 (Ministry of Education, 2002). In the basic education curriculum of 1978, English was an elective course in elementary and secondary levels (Ministry of Education, 2006; Satyarakwit & Chinnamethipitak, 2007). In the basic education curriculum of 2001, the main focus of English language teaching was for communicative purposes. The Thai National Act of 1999 stated that Thai students are required to study English from grades 1 to 12. Thus, the teaching of English in the current curriculum (2008) emphasizes the integration of the 4 language skills to prepare students to meet the real needs in a global society.

Of the 4 main language skills, reading is one of the four language skills that is necessary for acquiring knowledge and gathering information. Reading is a receptive skill in which the reader receives information. It is regarded as the most vital skill for students in both the classroom context and extracurricular environment (Carrell, 1989;

Grabe & Stoller, 2002; Scrivener, 2005). Hood and Soloman (1985 as cited in Suranee) mentioned that reading is an active process using our knowledge of the word (non-visual information) and of language (visual information) in constructing meaning. According to Suranee (1999), reading is the process of understanding something through the written text. It is an activity that requires comprehension skills to understand the written words or the idea of the author (Hafner, 1971). When people read, they actually construct their own meaning of a text (Anderson & Pearson, 1984; Rosenblatt, 1983). In addition, Wei (2005) wrote that reading is an important language skill for academic success and for professional development. The main objective of English language education at the secondary school level is to teach students to read English books and to encourage them to keep up with global development.

Many studies show that Thai students who learn English as a foreign language (EFL) have problems reading English texts. They cannot succeed in reading because they have difficulties with a language that is so different from their native Thai language. Generally speaking, Thai students also do not like reading, and this behavior leads them to have low achievement in reading. A survey by the National Statistical Office (2008) on the reading habits of Thai people revealed that people aged 6 years have decreased their reading ability from 69.1% (2005) to 66.3% (2008). The survey results showed that the percentage of Thais' reading from 2005 to 2008 went down by 2.8%. Most EFL students fail to read English effectively because when they are confronted with the reading materials, they are confused by grammatical structures and difficult vocabulary, and they lack background knowledge that could facilitate reading (Aebersold & Field, 1997; Dagostina & Carrifio, 1994; Nattall, 2000; Wei, 2005). Educators in Thailand who have investigated the reading ability of Thai students found that the reading ability of

Thais were at a low level. For example, the study conducted by Songsiri (1999) revealed that the English reading ability of Mattayom Suksa 6 students was very low. Students had poor skills in vocabulary, syntax, and grammar. They also lacked the ability to guess meaning from the context which affected other reading skills such as skimming for main ideas, scanning for details, making inferences, finding the reference, restating a point, differentiating between facts and opinions, and determining the author's mood and tone.

Apart from the problems mentioned above Thais' reading skill, the researcher found that there are other problems with reading skill. When it came to teaching reading to Mattayom Suksa 1 students, it was found that the ability to get the main idea, to find the details, to make inference, and to differentiate between fact and opinion presented difficulty. These problems resulted in low reading achievement when compared to other language skills. The traditional method of teaching reading used in Thailand with limited activities to gain students' interest bores students. As a result, this traditional method makes students lack opportunities to improve their reading skill, as well as reading comprehension. Therefore, both the traditional method and the other problems in developing reading skill of Thai students contribute to students' low reading skill.

The Department of Education (2001) announced that teachers should encourage a learning process that corresponds with the nature of language. Students should be taught to self study in order to develop their language skills. This would lead students to become more self-reliant and lifelong learners. In order for the nature of language to correspond with the scope of the current national curriculum, the researcher believes that the jigsaw II technique is one choice of appropriate learning methods for teachers to use with their students.

Jigsaw II technique is a type of activity which allows for a small group of students to work together in order to maximize their own and each other's learning (Slavin, 1995). It was adapted by Slavin in 1986. The activities in the jigsaw II technique is believed to reduce racial conflict among students, promote better learning, improve students' motivation, and increase enjoyment of the learning experience. Jigsaw II activities allow students to work in groups and read all the materials, which can help them unify the concepts easily (Slavin, 1995). In jigsaw II, three conditions must be applied: interactors must be of equal status, they must have common goals, and their collaboration should be officially sanctioned in the classroom. The procedures of jigsaw II promote reading and a great deal of active listening and speaking because the group members have to listen to their report and ask questions. Thus, students are motivated to study the material well and to work hard in their groups so that they can help their team. At the secondary school level, jigsaw II can enhance students' achievement, build their self-esteem, and foster mutual concern, which are important elements of learning process.

In conclusion, reading is one of the four necessary language skills which play an important role in EFL students' language development. Thai students are still confronted with the traditional teaching methods that do not interest and engage them. This combined with the fact that Thai students do not have a strong reading behavior have led to low achievement in reading skill. The researcher believes that the jigsaw II technique can solve the reading problems Thai students. As a result, the researcher wishes to study the effect of jigsaw II technique on reading comprehension of Mattayom Suksa 1 students.

Purposes of the Study

The study aims to compare Mattayom Suksa 1 students' achievement on reading comprehension consisting of four sub-skills before and after being taught by using the jigsaw II technique.

Significance of the Study

This study can be helpful for teachers in preparing reading activities that enhance student's reading comprehension. The findings of the study can be used as an alternative approach for EFL teachers to adapt the jigsaw II technique in a way that promotes students' English language skills.

Scope of the Study

The participants in this study were 25 students of Mattayom Suksa 1, who studied Foundation English E 21101 in the second semester of academic year 2011 at Watlaemsuwannaram Municipality School, Samut Sakhon. They were chosen by convenience sampling, which meant they were volunteer students who could stay after school until 6 PM.

Definition of Terms

The terms defined in this study are:

Jigsaw II technique refers to an activity that allows a small group of students to work together in order to maximize their own and each other's learning. The process of activity includes five major steps which are 1) reading, 2) expert-group discussion, 3) team report, 4) test, and 5) team recognition.

Reading comprehension in this study refers to 4 reading sub-skills; 1) reading for main idea, 2) reading for detail, 3) drawing inference, and 4) differentiating between fact and opinion.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter provides information on reading comprehension, comprehension skills, the jigsaw II technique, and related studies on the jigsaw II technique and reading problems of Thai students.

Reading Comprehension

Reading comprehension is an interactive process between the readers, the texts and the contexts (Aebersold & Field, 1997; Gunning, 2003; Roe, Stoodt & Burns, 2001). According to Urquhart and Weir (1998), reading comprehension is the process by which readers use their cognitive abilities to help them understand a written text. These cognitive abilities in reading are composed of two skills, language comprehension and language decoding. A reader needs to use these cognitive abilities to comprehend the meaning of a text and the intent of its author since different reading materials convey different kinds of information. To better reading comprehension skills, readers must possess the background knowledge that is relevant to what they are reading as the reading process involves the prior knowledge that the readers possess, the strategies they use, and the attitude toward reading they have. Additionally, language decoding involve a step in which a reader pronounces the written words correctly and quickly. This step is an important cognitive element for reading comprehension, one that leads the readers to recognize and process a written text. When readers encounter words that are frequently used, they become familiar with them, and word decoding is developed during this

process. The ability to decode a written text also involves guessing unfamiliar words from their context (Hirsch, 2003; Wren, 2001).

In conclusion, reading comprehension is a process that makes readers understand a text and for which they use two skills related to cognitive abilities, language comprehension and language decoding. In order to decode meaning from written texts, readers need to guess the meaning of unknown words. To comprehend the meaning of a text, a reader needs to possess prior knowledge on the text at hand, appropriate reading strategies, and motivation to read.

Comprehension Skills

Comprehension is an ability to get the meaning of something that cannot be observed or measured directly (Rubin, 1993). Comprehension involves thinking, and as there are various levels in the hierarchy of thinking, so are there various levels of comprehension. Higher levels of comprehension would obviously include higher levels of thinking. Smith (1969) explained that comprehension skills involve literal comprehension, interpretation, critical reading, and creative reading. Barrett (1993) has tried to categorize reading comprehension into taxonomy. Barrett's taxonomy consists of four levels: literal comprehension, inferential comprehension, evaluation, and appreciation. Literal comprehension is to require a low-level type of thinking; skills such as finding the main idea of a paragraph would not be included under the literal level of comprehension. However, in Barrett's taxonomy, "recognition of recall of main ideas" is included in his literal level. Finding the main idea of a paragraph is not easy even if the idea is directly stated in the paragraph; students must do more than use a low-level type of thinking to determine that something stated in the paragraph is the main idea. In other

words, any time that a student must interpret what he or she is reading, the student is required to do some reasoning that is beyond merely recalling what is in the text. There are various kinds of reading comprehension skill that a good teacher should have and he or she should suggest ways to help students acquire these needed and important skills. Interpretation, the next step in the hierarchy, demands a higher level of thinking ability because questions in the category of interpretation are concerned with answers that are not directly stated in the text but are suggested or implied. To answer questions at the interpretive level, readers must have problem-solving ability and be able to work at various levels of abstraction. The interpretive level is the one at which the most confusion exists when it comes to categorizing skills. The confusion concerns the term inference. The definition of inference is: Something derived by reasoning: something that is not directly stated but suggested in the statement; a logical conclusion that is drawn from statements; a deduction; an induction. From the definition we can see that inference is a broad reasoning skill involving analysis and synthesis and that there are many different kinds of inferences. All of the reading skills in interpretation rely on the reader's ability to "infer" the answer in one way or another. Critical reading is at a higher level than the other two categories because it involves evaluation, the making of a personal judgment on the accuracy, value, and truthfulness of what is read. To be able to make judgments, a reader must be able to collect, interpret, apply, analyze, and synthesize the information. Critical reading includes such skills as the ability to differentiate between fact and opinion, the ability to differentiate between fantasy and reality, and the ability to discern propaganda techniques. Creative reading uses divergent thinking skills to go beyond the literal comprehension, interpretation, and critical reading levels. In

creative reading, the reader tries to come up with new or alternative solutions to those presented by the writer.

In this study, the researcher is interested in studying four kinds of reading comprehension skill: reading for main idea, reading for detail, drawing inference, and differentiating between fact and opinion. The researcher was assigned to teach Mattayom Suksa 1 students and found that these skills were lacking, which presented reading problems for them. These problems also resulted in students' low reading achievement when compared to other language skills.

Reading for Main Idea

Reading for main idea is a skill that requires carefully reading a text to identify the main point without worrying about unnecessary details (Hood and Soloman, 1985). The main idea is the statement made about the topic which is supported by details. Therefore, the main idea is directly related to both the topic and the details in the paragraph. The main idea of a paragraph is the central thought of the paragraph and what the paragraph is about. Without a main idea, the paragraph would just be a confusion of sentences. All the sentences in the paragraph should develop the main idea. To find the main idea of a paragraph, a reader must find what common element the sentences share. Some textbook writers place the main idea at the beginning of a paragraph and may actually put the topic of the paragraph in bold print in order to emphasize it, but in literature this is not a common practice. In some paragraphs the main idea is not directly stated but implied. That is, the main idea is indirectly stated, and the reader has to find it from the clues given by the author. The reader must determine what the topic of the paragraph is and what the author is trying to say about the topic that is special or unique. Once the reader has found

these two things, the reader should have the main idea. This procedure is useful in finding the main idea of various types of paragraphs. In reading, the main idea helps readers to remember and understand what they have read.

Reading for Details

Reading for details is a skill that a reader has to get all information of the text thoroughly (Hood and Soloman, 1985). Readers need to be more careful and slower assuring that they have correctly understood the massage. While reading a selection, the first thing students need to do is to find its main idea. The next important thing is to be able to note and recall details. In order to find details that support the main idea, the reader should be able to identify which ideas are more important than the others. The more important details are called "major details", and we call the supporting details "minor details."

When giving the sequence of an event, steps to do something or cause of an event, the writer often uses some sentence signals which should be noticed. The signals usually found are, for example, "first, to begin with, to start with, second, third, next, then, also, another, the other, in addition, moreover, furthermore, finally, at last, and so on.

Drawing Inferences

Drawing inference is an activity in which the reader looks for clues and tries to guess what the passage is about (Hood and Soloman, 1985). The ability to draw inference is very important in reading comprehension. A reader needs to infer the topic or main idea of a text, the author's opinion, or other information. Inference is defined as understanding that is derived from an indirect suggestion of what is stated. Authors make

implications or imply meanings to make their writing more interesting and enjoyable. Rather than directly stating something, the authors present it indirectly. To understand the reading text, the reader must be able to detect the clues that the author gives. The ability to draw inference is based on a correct literal comprehension of the word, and on the careful interpretation of the literal meaning.

Differentiating between Fact and Opinion

Differentiating between fact and opinion is an activity to distinguish between a fact and an opinion. A fact is defined as a truth that is something can be proved or tested by experimentation, observation, or research and shown to be real. An opinion is defined as someone's belief, feeling or judgment about something. An opinion cannot be proven to everyone's satisfaction. The ability to differentiate between facts and opinions is a very important skill that students need to develop. It is important to help students as early as possible to determine whether information is factual or not.

In conclusion, reading comprehension is an important language skill that is a process students use to gather knowledge from the current global society. However, Thai students still have reading problems that come from many factors such as traditional teaching methods and students' dislike of reading. This results in their low reading achievement. Based on the researcher's experience with teaching, Mattayom Suksa 1 students still confront with reading comprehension problems, which are reading for main idea, reading for details, drawing inference, and differentiating between fact and opinion. Therefore, the researcher aimed to solve these problems Mattayom Suksa 1 students have.

The Jigsaw II Technique

Jigsaw teaching was developed by Elliot Aronson and his colleagues (1978). There are two jigsaw methods, original jigsaw and jigsaw II.

The original jigsaw or jigsaw I is the first jigsaw method that was developed by Aronson and his colleagues in 1978. The original jigsaw requires each student to read and become an expert on only one part of a reading selection rather than reading the entire selection. This approach would require accessible instructional material neatly divided into four or five appropriate topics. For example, in a unit on Chile, one student might have information on Chile's economy, another on its geography, a third on its history, and so forth. To know all about Chile, students must rely on their teammates. Original jigsaw also takes a little time because its readings are shorter, only a part of the total unit to be studied.

Later in 1986, Slavin adapted Elliot Aronson's original jigsaw to be more practical and in an easier format; he called it jigsaw II. Jigsaw II is an activity that allows a small group of students to work together in order to maximize their own and each other's learning (Slavin, 1995). Jigsaw II can be used whenever the material to be studied is in written narrative form. It is most appropriate in such subjects as social studies, literature, some parts of science, and related areas in which concepts, rather than skills, are the learning goals. The instructional material for jigsaw II should usually be a chapter, story, biography or similar narrative or descriptive material. Jigsaw II students work in five heterogeneous groups of six or so students each on material that the teacher has broken into subsections for each student to work on.

Both original jigsaw and jigsaw II enable students to read effectively. But the advantage of jigsaw II that all students read all the material, which may make unified

concepts easier to understand. Jigsaw II has a more practical and easier form than original jigsaw (Slavin, 1986a). Therefore, the researcher is interested in investigating the effect of the jigsaw II technique on the reading comprehension of Mattayom Suksa 1 students. The following information describes in more detail of the jigsaw II technique.

In Jigsaw II, students work in small teams, composed of four or five students who represent a cross-section of the class in terms of academic performance, sex, and race or ethnicity. The team should also have a high performer, a low performer, and two average performers. The students are assigned chapters or other units to read, and are given "expert sheets" that contain different topics for each team member to focus on when reading. When everyone has finished reading, students from different teams with the same topic meet in an "expert group" to discuss their topic for about thirty minutes. The experts then return to their teams and take turns teaching their teammates about their topic. Finally, students take assessments that cover all the topics, and the quiz scores become team scores. Also the scores that students contribute to their teams are based on the individual improvement score system, so students are motivated to study the material well and to work hard in their expert groups so that they can help their team do well. The key to jigsaw is interdependence: every student depends on his or her teammates to provide the information needed to do well on the assessments.

The following procedures show the construction of the material used in the jigsaw II activity that the teacher should

1. select one or more chapters, stories, or other units, each covering material for two or three days. If students are to read in class, the selections should not require more than a half hour to complete; if the reading is to be assigned for homework, the selections can be longer.

2. make an expert sheet that is a subtopic sheet divided from a topic for each unit. This tells students what to concentrate on while they read, and which expert group they will work with. It identifies four topics that are central to the unit.

3. make a quiz, essay test, or other assessment for each unit. The questions in a quiz should require considerable understanding, because students will have had ample time to discuss their topics in depth, and easy questions would fail to challenge those who have done a good job in preparation. However, the questions should not be obscure.

Assignment of Students to Teams

Assign students to four-or five member heterogeneous teams. Each team is composed of four or five students who represent a cross-section of the class in terms of academic performance, sex, and race or ethnicity. The team would also have a high performer, a low performer, and two average performers. High performer is a relative term: it means high for the class, not necessarily high compared with national norms.

Assignment of Students to Expert Groups

Students of each team are assigned randomly to the expert group, ensuring that there are high, average, and low achievers in each group. If your class has more than twenty-four students, you should have two expert groups on each topic, so that there will not be more than six students in each expert group; an expert group larger than six can be unwieldy.

The following activities show the cycle of jigsaw II which are described in detail. Jigsaw II technique refers to an activity that allows a small group of students to work together in order to maximize their own and each other's learning. The process of activity includes five major steps which are reading, expert-group discussion, team report test, and team recognition (Slavin, 1995) (illustration in Figure 1).

Reading

Students are formed into teams so that each team has a high performer, a low performer, and three average performers. Each team in this step is called the "home team". Reading is the first step of jigsaw II. It is distribution of texts, expert topics, and assignment of a topic to each student. The teacher passes out expert sheets and then goes to each team and points out which students are to take which topic. When students have their topics, they read their materials. Students who finish reading before others can make notes.

Expert-group Discussions

The teacher has all students with expert topic 1 get together at one table, all students with expert topic 2 at another table, and so on. A group with the same expert topic is called the "expert group". The teacher appoints a discussion leader for each group. The discussion leader need not be a particularly able student, and all students should have an opportunity to fill this role at some time. The leader's job is to moderate the discussion, calling on group members who raise their hands and trying to see that everyone participates. While the expert groups are working, the teacher should spend time with each group in turn. The teacher may wish to answer questions and resolve

misunderstandings, but should not try to take leadership over the groups – that is the discussion leaders' responsibility. The teacher may need to remind discussion leaders that part of their job is to see that everyone participates.

Team Report

Students return from their expert-group discussions and prepare to teach their topics to their home team members. This step takes about five minutes to review everything they have learned about their topics from their reading and their discussions in the expert groups. Emphasize to students that they have a responsibility to their teammates to be good teachers as well as good listeners. Teachers may wish to have experts question their teammates after they have reported to them to see that they have learned the material and are ready for the quiz.

Test

The teacher distributes the quizzes and allows enough time for everyone to finish. Students can exchange quizzes with members of other teams for scoring, or they can be collected and scored by the teacher. If students do the scoring, have the checkers put their name at the bottom of the quizzes they checked. After class, spot-check several quizzes to be sure that the students did a good job of checking.

Team Recognition

As soon as possible after each quiz, figure individual improvement scores and team scores and awards certificates or other rewards to high-scoring teams. If possible, announce team scores in the first period after the quiz. This makes the connection between doing well and receiving recognition clear to students, and in turn increases their motivation to do their best.

To sum up, jigsaw II gets students to work in five heterogeneous groups of four or five. Jigsaw II promotes a profound exploration of content, and results in higher academic achievement of students. It also provides an excellent learning environment for the acquisition of language through the relevant content.

In Figure 1, the researcher illustrates the steps of jigsaw II technique.

The steps of jigsaw II technique

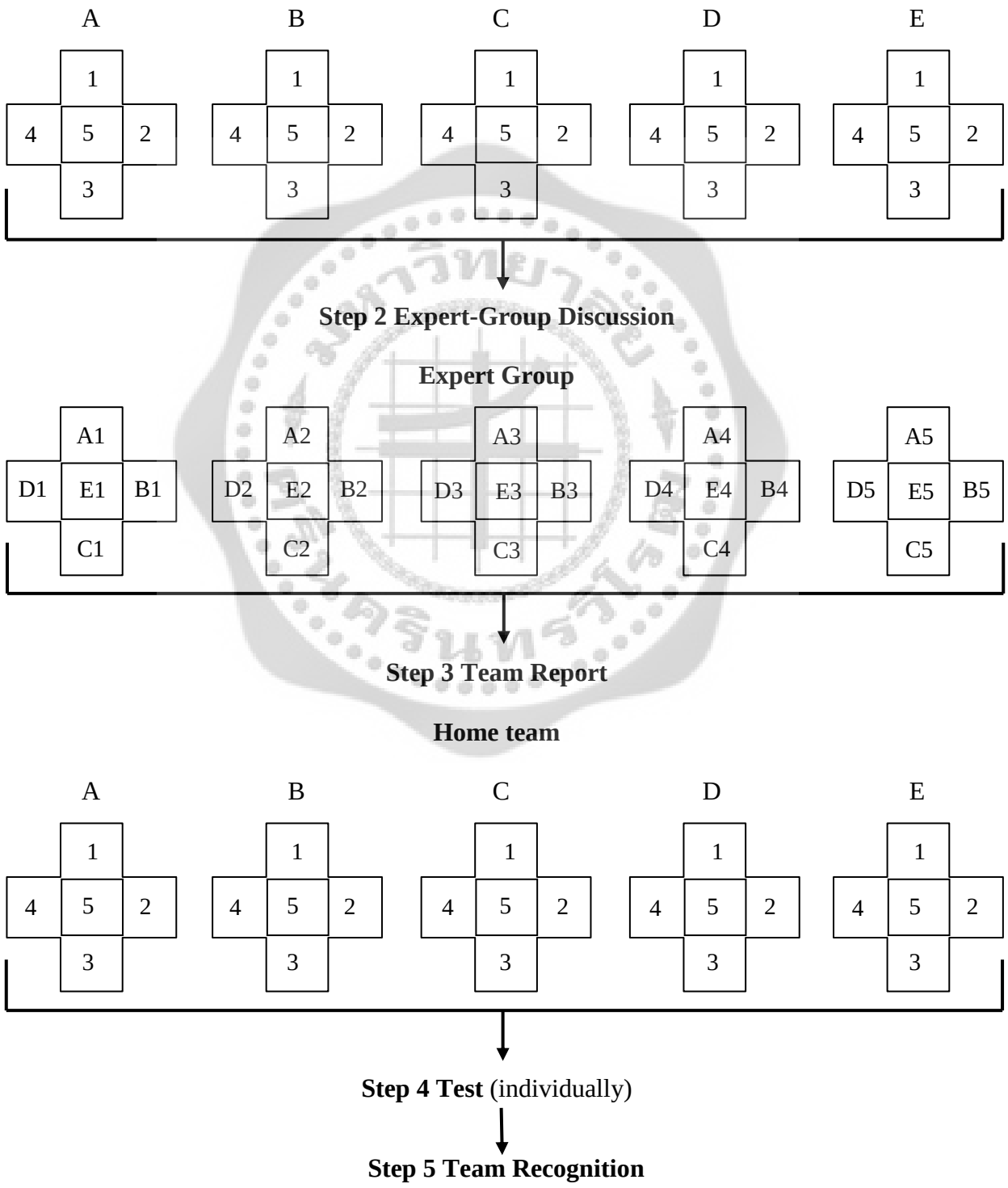

Figure 1 The steps of Jigsaw II Technique

Related Studies on the Jigsaw II Technique and Reading Problems of Thai Students

The researches discussed in this part are on five studies on the jigsaw II technique and four studies on the reading problems of Thai students.

Related Studies on the Jigsaw II Technique

The following researches presented important results on the jigsaw technique.

The most positive effects of a Jigsaw-related intervention were found in a study by Ziegler (1981) of jigsaw II in classes composed of recent European and West Indian immigrants with Anglo-Canadians in Toronto. She found substantially more cross-ethnic friendships in the jigsaw II classes than in control classes, both on an immediate post-test and on a ten-week follow-up. These effects were for both "casual friendships" ("Who in this class have you called on the telephone in the last two weeks?") and "close friendships" ("Who in this class have you spent time with after school in the last two weeks?")

Meteetum (2001) explored case studies of cooperative learning through use of the jigsaw technique with second-year English major students at Naresuan University. The research was to study the potential of cooperative learning through the jigsaw technique in the Thai context to improve the communicative ability of students. The subjects were 9 second-year English major students selected from a population of 53 students attending the Faculty of Humanities and Social Science, Naresuan University for the 2001 academic year. The research instruments were a grammar test, a structured field observation, a semi-structured interview and a reflective journal. The findings indicated that cooperative learning through use of the jigsaw technique encouraged the subjects to produce extended English discourse in a meaningful manner in authentic contexts. In

addition, the quality of language input, output, and context had a positive impact on the subjects' language acquisition.

Kuntjaraningrat (2003) investigated the effectiveness of the jigsaw technique in improving students' reading comprehension. The study used a quasi-experimental design with pretest and post-test. The study involved 2 classes of second grade students at SMP Nejeri 1 Cianjur as the sample. The finding indicated that the jigsaw technique treatment was significantly effective in improving students' reading comprehension. The findings from the questionnaire showed that almost all students were interested in jigsaw technique because of its advantages. Students said that the jigsaw technique helped them to comprehend the text easily. Students could participate more in the learning process. The result was that the jigsaw technique helped students improve their English ability.

Ghina (2005) studied the effect of the jigsaw II versus whole class instruction on EFL students' reading motivation and achievement. The participants were 44 grade five students in a private school in Lebanon. The students were randomly assigned to control and experimental conditions, and a post-test only control group design was employed. The experimental group was instructed according to the dynamics of the jigsaw II method whereas the control group was taught according to whole class instruction. Results indicated that the jigsaw technique had a significant effect on students' self concepts as readers, which is the value they place on reading and their reading motivation.

In conclusion, the results of these studies have shown that the jigsaw technique treatment significantly improve students' reading comprehension and English ability. The Jigsaw technique should be applied in teaching reading comprehension and used along with other interesting strategies. It also can be an effective way to deal with the problems faced by Thai teachers in EFL classes. It creates a comfortable non-stressful

environment for learning and practicing English. It helps students to learn more, have more fun, and develop many other skills such as learning how to work with one another.

Related Studies on Reading Problems of Thai Students

The results of various studies investigating reading ability indicate that Thai students have low levels of reading proficiency.

Wongsuwan (1992) conducted a study to determine the reading problems of Mattayom Suksa 6 students in the demonstration schools affiliated with the Ministry of University Affairs. Four hundred and ninety-six students were selected for the study: 266 students from Bangkok and 230 students from other provinces; 272 of them were science students and 224 art students. A reading test was used as an investigative instrument. It was found that science and art students in Bangkok and in the provinces reached an average level in three main areas of reading ability: (a) sentence structure, (b) vocabulary in context, and (c) paragraph organization. It was also found that there was no significant difference between Bangkok students and students in the provinces in the mean scores on sentence structure, but there were significant differences in vocabulary in context and paragraph organization.

Sritamai (1993) investigated the linguistic competence of Matayom Suksa 6 students in three areas: (a) phonology, (b) vocabulary, and (c) grammar. The subjects were 916 Matayom Suksa 6 students in the second semester of the academic year 1992. The instrument used in this study was an English linguistic competence test that aimed to investigate knowledge in phonology, vocabulary, and grammar. It was found that the participants had limited English linguistic competence; that is, the English linguistic competence of the participants was lower than the minimum level.

Sutta (1994) investigated the ability in using reading comprehension skills in reading expository texts. The participants were 56 graduate students in the Master of Arts in the teaching programs of Kasetsart University. The instrument used in this study was a multiple-choice test comprised of 40 questions. The test was constructed to measure the ability in using six different skills: (a) main idea, (b) detail, (c) sequence, (d) compare-contrast, (e) cause-effect, and (f) drawing conclusion and predicting outcomes. The results of the study revealed that the subjects' ability in using reading comprehension skills in reading expository texts was not proficient.

Songsiri (1999) conducted a study to investigate the English reading skills of Mattayom Suksa 6 students. Twelve students from six classes at Protpittayapayat School were selected to test their reading ability. They were also interviewed to investigate their attitude towards English reading. It was found that these students had a below satisfactory level of English reading proficiency. Only 1% of the students earned good grades (80%-87%), and 67.5% of them were evaluated as poor (23%- 47%). The students were poorly skilled in vocabulary, grammatical rules, and background knowledge. However, in investigating their attitude, it was found that they felt positive towards English reading and that they were highly interested in improving their English reading skills.

Similarly, Jesdapornpun (2001) conducted a study to investigate problems related to English reading shared by 18 technicians at the company Samart Comtech. It was found that all the participants had difficulties with unfamiliar words and with understanding meanings from sentences and passages. When they encountered unfamiliar words, they consulted a dictionary to translate them. However, they stated that consulting a dictionary did not help them better understand the text. Additionally, it was

found that the participants had limited background knowledge on their reading and that grammatical structure was the main problem that obstructed their extracting meaning from the text.

Intarasombat (2002) studied the effect of vocabulary development of English reading comprehension. The subjects were 40 students in the science program. The instrument used in this study consisted of vocabulary test and reading sub-test. Vocabulary test was used to measure Matayom Suksa 4 students' knowledge of vocabulary. Reading comprehension test was used to measure the students' reading comprehension. It was found that the students' mean score in the vocabulary test and reading comprehension test was low. This indicated that the students had limited vocabulary knowledge and this area caused them problems of English reading comprehension.

It can be concluded that high school and college students, as well as those with occupations, were unable to read effectively because they had problems with vocabulary in context, sentence structure, paragraph organization, and background knowledge.

CHAPTER III

RESEARCH METHODOLOGY

This chapter describes the research methodology which includes participants, variables, duration, research instruments, data collection, and data analysis.

Participants

The population in this study were 60 students from Mattayom Suksa 1, who studied Foundation English E 21101 in the second semester of academic year 2011 at Watlaemsuwannaram Municipality School, Samut Sakhon.

The participants in this study were 25 students of Mattayom Suksa 1, who studied Foundation English E 21101 in the second semester of academic year 2011 at Watlaemsuwannaram Municipality School, Samut Sakhon. They were selected by convenience sampling from students who volunteered to stay after school until 6 PM.

Variables

The variables in this study are:

1. Independent variable: Jigsaw II technique
2. Dependent variables: Reading comprehension sub-skills
    - 2.1 Reading for main idea
    - 2.2 Reading for detail
    - 2.3 Drawing inference
    - 2.4 Differentiating between fact and opinion

Duration

The duration of this study was 8 weeks. Each week there was a lesson which lasted 2 hours. There was a total 16 hours taking place from November to December 2011, excluding the pretest and post-test periods.

Research Instrument

The research instruments used in this study consisted of a reading comprehension pretest/post-test and 8 jigsaw II technique lesson plans.

Reading Comprehension Test

The reading comprehension test is divided into 2 parts, multiple-choice in part one and two-option answers in part two. The following procedures were done by the researcher in constructing the test.

1. Construction of 60 items of multiple-choice questions in part one to evaluate three reading comprehension sub-skills: 1) reading for main idea, 2) reading for detail, and 3) drawing inference

2. Construction of 20 items with two-option answers in part two to evaluate one other reading comprehension sub-skill, differentiating between fact and opinion

3. Evaluation of the constructed test to be evaluated by 3 specialists in English instruction using IOC technique, in which items with IOC above .50 were selected

4. Trial period with 28 students, who were not participants, to analyze the level of difficulty (P) and power of discrimination (r) by 50% technique of which 30 items of part one and 10 items of part two with the level of difficulty between .20-.80 and the power of discrimination at .20 or over were selected

5. Analysis of selected items for the reliability by Kuder-Richardson Formula 20 (KR_{20})

Jigsaw II Technique Lesson Plan

Eight lesson plans utilizing jigsaw II technique as a method of teaching were specially designed with the following processes.

1. Review of the English curriculum of Ministry of Education (2008) in terms of objectives, areas of content, vocabulary, and grammar structures as well as the documents related to jigsaw II technique

2. Selection of reading materials from school textbooks, journals, and authentic texts that corresponded with the English curriculum of Ministry of Education 2008

Reading materials were selected covering 8 topics as follows:

1. Animals
2. Cooking
3. Inventions
4. Special Days
5. A Cultural Queen
6. Interesting People
7. His Majesty the King
8. Greetings from Around the World

3. Construction of lesson plans that included five steps of the jigsaw II technique: 1) reading, 2) expert-group discussion, 3) team report, 4) test, and 5) team recognition

4. Evaluation of the constructed jigsaw II technique lesson plans for validity by 3 specialists in English instruction

5. Revision of the lesson plans as advised by the specialists

6. Trial period of the lesson plans with the students of the population who were not participants to verify whether content and duration were appropriate

7. Application of the lesson plans with the participants

Data Collection

This study is experimental research using one-group pretest-post-test design. The details of data collection procedures are as follows:

1. The researcher explained to the participants about the objective of activities, learning process, and assessment.

2. The participants were given one hour to do the reading comprehension pretest.

3. The researcher taught reading comprehension using the constructed jigsaw II technique lesson plan.

4. At the end of each topic, the participants took an individual quiz, which was the fourth step of the jigsaw II technique.

5. After completing all lesson plans, the participants took the reading comprehension post-test.

6. The data from the test were collected and analyzed.

Data Analysis

The data were analyzed to fulfill the purpose of this study.

1. The scores of each sub-skill on the pretest and post-test were analyzed by mean and standard deviation (S.D.) and compared by t-test dependent to check if the mean

scores of the pretest and post-test were significantly different in reading comprehension sub-skills after learning by using the jigsaw II technique.

2. The scores on reading comprehension on the pretest and post-test were analyzed by mean and standard deviation (S.D.) and compared by t-test dependent to check if the mean scores of the pretest and post-test were significantly different.

The statistics used to analyze in this study were:

Descriptive Statistic

Mean ($\overline{X}$) and Standard Deviation (*S.D.*) were used to analyze the pretest and post-test scores of students' reading comprehension test.

Statistic for Testing Materials

The Index of Congruence (IOC) was used to analyze correspondence between objectives and tests.

50% Technique (Wibulsri, 2008) was used to analyze the level of difficulty (P) and power of discrimination (r) of the reading comprehension test.

Kuder-Richardson Formula 20 (KR_{20}) was used to analyze the reliability of the reading comprehension test.

CHAPTER IV

FINDINGS

This chapter presents the findings of the study on the effect of using the jigsaw II technique on the reading comprehension of Mattayom Suksa 1 students at Watlaemsuwannaram Municipality School, Samut Sakhon. The findings are presented according to the purpose of the study, which was to compare Mattayom Suksa 1 students' achievement on reading comprehension consisting of four sub-skills before and after being taught by using the jigsaw II technique.

The following results display the findings of a comparison of Mattayom Suksa 1 students' achievement on reading comprehension of four sub-skills before and after being taught by using the jigsaw II technique.

Table 1

A Comparison of Students' Achievement of Reading for Main Idea on the Pretest and Post-test (N=25)

Reading for Main Idea	$\overline{X}$	*S.D.*	**t***
Pretest	2.84	1.491	3.091
Post-test	3.72	1.429	

*p<.05, df = 24, t = 2.064

Table 1 shows a comparison of students' achievement of reading for main idea on the pretest and post-test. The students' achievement was significantly higher at the .05 level after being taught by using the jigsaw II technique. The results showed that the mean score of the post-test was 0.88 higher than the pretest (from 2.84 to 3.72). The standard deviation of the pretest and post-test were 1.491 and 1.429, respectively.

Table 2

A Comparison of Students' Achievement of Reading for Detail on the Pretest and Post-test (N=25)

Reading for Detail	$\overline{X}$	*S.D.*	**t***
Pretest	6.08	2.499	1.048
Post-test	6.72	2.283	

*p<.05, df = 24, t = 2.064

Table 2 shows a comparison of students' achievement of reading for detail on the pretest and post-test. The students' achievement was slightly higher after being taught by using the jigsaw II technique, but it was not significantly higher at the .05 level. The results showed that the mean score of the post-test was 0.64 higher than the pretest (from 6.08 to 6.72). The standard deviation of the pretest and post-test were 2.499 and 2.283, respectively.

Table 3

A Comparison of Students' Achievement of Drawing Inference

on the Pretest and Post-test (N=25)

Drawing Inference	$\overline{X}$	*S.D.*	**t***
Pretest	5.76	1.809	3.328
Posttest	6.96	1.513	

*p<.05, df = 24, t = 2.064

Table 3 shows a comparison of students' achievement of drawing inference on pretest and post-test. The students' achievement was significantly higher at the .05 level after being taught by using the jigsaw II technique. The results showed that the mean score of the post-test was 1.2 higher than the pretest (from 5.76 to 6.96). The standard deviation of the pretest and post-test were 1.809 and 1.513, respectively.

Table 4

A Comparison of Students' Achievement of Differentiating between Fact and Opinion

on the Pretest and Post-test (N=25)

Differentiating between Fact and Opinion	$\overline{X}$	*S.D.*	**t***
Pretest	6.60	1.803	.746
Posttest	6.96	1.513	

*p<.05, df = 24, t = 2.064

Table 4 shows a comparison of students' achievement of differentiating between fact and opinion on the pretest and post-test. The students' achievement was slightly higher after being taught by using the jigsaw II technique, but it was not significantly higher at the .05 level. The results showed that the mean score of the post-test was 0.36 higher than the pretest (from 6.60 to 6.96). The standard deviation of the pretest and post-test were 1.803 and 1.513, respectively.

To sum up, it was found that Mattayom Suksa 1 students' achievement on reading comprehension on four sub-skills was higher after being taught by using the jigsaw II technique. The results showed that reading for main idea and drawing inference were significantly higher at the .05 level. But reading for detail and differentiating between fact and opinion were not significantly higher at the .05 level.

In addition, the following table is a comparison of Mattayom Suksa 1 students' achievement on reading comprehension before and after being taught by using the jigsaw II technique. The study results are displayed in Table 5.

Table 5

A Comparison of Students' Achievement of Reading Comprehension on the Pretest and Post-test (N=25)

Reading Comprehension	$\overline{X}$	*S.D.*	**t***
Pretest	21.32	4.488	6.517
Posttest	25.08	5.196	

*p<.05, df = 24, t = 2.064

According to Table 5, the Mattayom Suksa 1 students' achievement on reading comprehension was higher after being taught by using the jigsaw II technique. The mean score on the post-test was 3.76 higher than the pretest (from 21.32 to 25.08). The standard deviation of pretest and post-test were 4.488 and 5.196, respectively. Thus, the students' achievement on reading comprehension after being taught by using the jigsaw II technique was significantly higher at the .05 level.

CHAPTER V

CONCLUSION AND DISCUSSION

The purpose of this study was to investigate the effect of using the jigsaw II technique on the reading comprehension skills of Mattayom Suksa 1 students. The participants of the study were 25 Mattayom Suksa 1 students at Watlaemsuwannaram Municipality School, Samut Sakhon. They were chosen by convenience sampling; the participants were volunteer students willing to stay after class until 6 PM. This was an experimental research study using one-group pretest-post-test design. The data from this study were obtained through an English reading comprehension test and analyzed according to the purpose of the study, which was to compare Mattayom Suksa 1 students' achievement on reading comprehension, consisting of four sub-skills, before and after being taught by using the jigsaw II technique.

Summary of the Study

The findings were summarized in accordance with the study to compare Mattayom Suksa 1 students' achievement on reading comprehension, consisting of four sub-skills, before and after being taught by using the jigsaw II technique.

The scores on reading comprehension on the pretest and post-test were analyzed by mean and standard deviation (S.D.) and compared by t-test dependent to check if the mean scores of pretest and post-test were significantly different in reading comprehension after learning through the jigsaw II technique. The results revealed that Mattayom Suksa 1 students' achievement on reading comprehension was higher after being taught by using the jigsaw II technique. The mean score on the post-test was higher than the pretest, from

21.32 to 25.08. Thus, the students' achievement on reading comprehension after being taught by using the jigsaw II technique was significantly higher at the .05 level.

In addition, the score of each sub-skill on the pretest and post-test was analyzed by mean and standard deviation (S.D.) and compared by t-test dependent to check if the mean scores on the pretest and post-test had been significantly different on the reading comprehension sub-skills after learning through the jigsaw II technique. The results showed that students' achievement on the reading comprehension sub-skills were higher after being taught by using the jigsaw II technique. The difference between the mean scores of the pretest and post-test on reading comprehension are reflected in the following results in each sub-skill: drawing inference was 1.2 (from 5.76 to 6.96), reading for main idea was 0.88 (from 2.84 to 3.72), reading for detail was 0.64 (from 6.08 to 6.72), and differentiating between fact and opinion was 0.39 (from 6.60 to 6.96). It was found that reading for main idea and drawing inference were significantly higher at the .05 level. But reading for detail and differentiating between fact and opinion were not significantly higher at the .05 level, because the difference between mean scores of the pretest and post-test were only slightly higher.

Discussion of the Findings

The results are discussed in accordance with the purpose of the study that was to compare Mattayom Suksa 1 students' achievement on reading comprehension consisting of four sub-skills before and after being taught by using the jigsaw II technique.

The findings revealed that the overall effect on students' achievement in reading comprehension after being taught by using the jigsaw II technique was significantly higher at the .05 level. The jigsaw II procedure promoted reading and a great deal of

active listening and speaking, especially in step 2 (expert-group discussion) and step 3 (team report). In step 2, all students with the same topics got together to read and discuss their topics. Students took notes on all points discussed. In step 3, all students returned to their home teams. Each team member was given about five minutes to present information on the topic. At the same time, each team member had to listen to students spoke on the rest of the topics. In this step, it was emphasized on students that it was their responsibility to be a good listener, as well. This findings support Slavin' s claims about the instructional conditions which must be met for small groups. First, students in a learning group must work toward a group goal and reward which can be achieved only if they work together cooperatively (Mattingly & Vansickle, 1991). Second, students must be publicly accountable to their peers for their individual contributions to the achievement of the group's goal. A well-planned cooperative learning technique, such as jigsaw II, is feasible and an effective way for social studies teachers to increase their students' academic achievement. Ghazi and Anwar (1995) chose jigsaw II because it enabled students to experience active listening and speaking as they read and discussed the assigned material in their groups and then returned to their teams to teach their team members. The study conducted by Ghina (2005) investigated the effect of jigsaw II versus whole class instruction on EFL students' reading motivation and achievement. The results indicated that Jigsaw II had a significant effect on students' self concepts as reader, which is the value they place on reading and their reading motivation. This corresponds with the study conducted by Kuntjaraningrat, (2003) who looked at the effectiveness of the jigsaw technique in improving students' reading comprehension. The findings indicated that the jigsaw technique treatment was significantly effective in improving students' reading comprehension. The findings from the questionnaire showed

that almost all students were interested in jigsaw technique. Students said that the jigsaw technique helps them to comprehend the text easily. Students could more fully participate in the learning process, thus the jigsaw technique help students to improve their English skills.

Additionally, when regarding each of the four sub-skills of reading comprehension (reading for main idea, reading for detail, drawing inference, and differentiating between fact and opinion) the findings revealed that the students' achievement of drawing inference and reading for main idea were significantly higher at the .05 level after being taught by using the jigsaw II technique. However, the students' achievement of reading for detail and differentiating between fact and opinion were not significantly higher at the .05 level because the post-test scores were only slightly higher than the pretest scores. There might be several factors that caused students' achievement of some reading comprehension sub-skills to not be significantly higher after being taught by using the jigsaw II technique. Firstly, the steps in jigsaw II did not help to develop all sub-skills of reading comprehension. In addition, the reading problems of Thai students may have contributed to low achievement in some sub-skills. This is consistent with the study conducted by Sutta (1994), who studied Thai students lack in ability in getting the main idea and predicting the author's purpose. These problems lead to difficulty in reading comprehension. In the study, the participants also had comprehension problems. Few of them could use the information in the passage to predict what would happen next. Less than 30% of them were able to identify the topic or the important ideas of the passage. According to a study conducted by Sritamai (1993), students had limited English linguistic competence (in vocabulary and grammar). The English linguistic competence of the participants was lower than the minimum level. The results indicated

that over 60% of the participants had problems in all three areas of the reading test: (a) sentence structure, (b) vocabulary, and (c) reading comprehension. Corresponding with the study conducted by Intarasombat (2002), limited vocabulary knowledge caused problems in the English reading comprehension of the students. Therefore, knowledge of vocabulary is extremely important in reading comprehension. Wongsuwan (1992) conducted a study to determine the reading problems of Mattayom Suksa 6 students in the demonstration schools affiliated to the Ministry of University Affairs. It was found that science and art students in Bangkok and in the provinces reached an average level in three main areas of reading ability: (a) sentence structure, (b) vocabulary in context, and (c) paragraph organization. Songsiri (1999) conducted a study to investigate the English reading skills of Mattayom Suksa 6 students. It was found that these students had a low satisfactory level of English reading proficiency. Only 1% of the students earned good grades (80%-87%), and 67.5% of them were rated as poor (23%- 47%). The students had poor skills in vocabulary, grammatical rules, and background knowledge.

In consideration of all this, teachers should try to use various strategies to help students to improve and develop their reading comprehension. Moreover, teachers should realize the problems and choose the most appropriate teaching method, prepare teaching materials, and use suitable teaching techniques in order to help students to improve all reading comprehension sub-skills, as well.

Suggestions

This part offers suggestions in accordance with the findings on the effect of using the jigsaw II technique on the reading comprehension of Mattayom Suksa 1 students.

There are many suggestions in accordance with the findings that teachers should apply to improve the classroom. Firstly, teachers should guide students through the activities in each step and also teach using sample lesson plans to make sure whether they understand the learning process when using the jigsaw II technique. Secondly, teachers should emphasize to students what their responsibilities are to their teammates, to accept differences, and to appreciate that everyone has something valuable to contribute to the team or group. Thirdly, teachers should give students a chance to choose or search for reading materials such as a chapter, story, biography and narrative or descriptive material in which they are interested. Reading materials chosen by students may be a good way to motivate students' learning process, as well. Fourthly, when testing, teachers should test students in many ways such as writing essays or oral reporting instead of taking an individual quiz. Lastly, teachers should use other instruments to prove students' achievement such as an observation form to observe students working in groups instead of using only a reading comprehension test.

To sum up, Thai students should be encouraged to improve their English skills, because success in English does not happen overnight. Teachers are essential in stimulating the promotion of students becoming better learners.

Recommendations for Further Studies

The recommendations for further studies are presented as follows:

1) In the jigsaw II activity, students worked in small groups and shared and discussed the information of their topics. Students had a chance to speak while they were reporting their topics, then they had to listen to other members' topics. Obviously, jigsaw II helped students to experience listening and speaking as they discussed the reading materials in groups. For further studies, the use of the jigsaw II technique should be investigated for listening and speaking skills to confirm whether these language skills can enhance students' achievement through the jigsaw II technique.

2) This study was conducted with one group of participants. The results of the study, therefore, could not be generalized. For further studies, participants in the study should have two groups (one for the experimental group and another for as the control group) in order to better generalize the findings.

Limitation of the Study

The participants in this study were 25 Mattayom Suksa 1 students studying at Watlaemsuwannaram Municipality School, Samut Sakhon. The study used one-group pretest-post-test design. The findings might not be generalized to other students studying in Mattayom Suksa 1. Students tended to speak Thai more than English while they were reporting and discussing information in their groups. For other studies, in which students use English more than Thai to report and discuss information, the results may yield different findings.

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APPENDICES

APPENDIX A

A reading comprehension test

Reading Comprehension Test

.....

<u>Part I</u> : Choose the best answer.

<u>School Poetry Contest</u>

Submit your poem by Fri, May 3.

Result announced on May 6

First Prize – 3000 baht

Second Prize – 2000 baht

Third Prize – 1000 baht

1. What is this notice for? (Drawing Inference)

(A) To announce a contest (B) To get a school bag

(C) To win a prize (D) To write a poem

2. What does the best poem win? (Reading for Detail)

(A) A poem (B) Result

(C) A school shirt (D) Money

3. Which of the following is true? (Drawing Inference)

(A) The contest costs 500 baht. (B) Results are on Monday.

(C) The contest is at the university. (D) Results are on Friday.

Durian is a very large green fruit.

It is found in Southeast Asia.

It may smell terrible, but it tastes like ice cream!

4. Who might see this information? (Drawing Inference)

(A) A person in a grocery store (B) A person in an ice cream shop

(C) A person in Southeast Asia (D) A person eating a durian

5. What kind of person might like durian? (Drawing Inference)

(A) Someone who likes fruit (B) Someone who hates bad smells

(C) Someone who cannot smell very well (D) Someone who eats melons

6. Which of the following is true? (Drawing Inference)

(A) Durian tastes good. (B) Durian smells good.

(C) Durian is a kind of potato. (D) Durian is found in Tibet.

Do you drink too much coffee?

How much coffee is too much? Most doctors say one cup a day is more than enough. However, most people who work in offices drink two or more cups a day. Many drink coffee during breaks, at lunch, and on their way to and from work. On the other hand, most people don't drink enough water. This is especially a problem for coffee drinkers. When people drink coffee, they don't drink water. Most doctors agree that everyone should drink at least eight glasses of water a day.

7. What type of reading is this? (Drawing Inference)

(A) A letter (B) A table

(C) An article (D) A memo

Scientists have known for a long time that vitamin D is essential for humans. If children have a vitamin D or calcium deficiency, they can develop rickets, a softening of the bones. New studies are showing that people of all ages need vitamin D to help them fight off diseases by keeping their immune systems strong.

8. The main idea of this paragraph is that vitamin D _____. (Reading for Main idea)

(A) is found in milk

(B) has been studied by scientists

(C) is no secret

(D) is important for good health

9. If something is essential, it is _____. (Drawing Inference)

(A) harmful

(B) expensive

(C) dreadful

(D) needed

10. When you have a deficiency of something, you _____. (Drawing Inference)

(A) have all you need

(B) do not have enough

(C) look like an onion

(D) are rich

A major handicap of young people and adults in getting good jobs is not necessarily lack of intelligence. Often it is the lack of ability to read well enough to meet the job demands.

11. The main idea is:_____. (Reading for Main idea)

(A) The great problem to get good jobs is handicapped by young people and adults.

(B) Lack of intelligence is never a handicap in getting a job.

(C) Many industries now after training to reading for their employees.

(D) The chance for employment rests in part upon the ability to read.

My house is in the United States. I live in the United States. The United States is a country. I like living in the US. My house is in North Carolina. North Carolina is a state. The weather in NC is nice. It is sunny. The sky is blue. My house is in Chapel Hill. I live in Chapel Hill. Chapel Hill is a city. It is a city on a hill. My house is red. My house is brick. I live in a red brick house.

12. What is the United States? (Reading for Detail)

(A) a city (B) a state

(C) a country (D) a town

13. What is North Carolina? (Reading for Detail)

(A) a city (B) a state

(C) a country (D) a town

14. What is a Chapel Hill? (Reading for Detail)

(A) a city (B) a state

(C) a country (D) a town

15. What is the weather like in Chapel Hill? (Reading for Detail)

(A) rainy (B) sunny

(C) cloudy (D) snowy

16. What is the house made of? (Reading for Detail)

(A) wood (B) brick

(C) metal (D) paper

A bird is a kind of animal.

A bird has two wings. Birds are the only animal with feathers. Pigeons, eagles, swans, and blue jays are all kinds of birds. Most of birds can fly. Turkeys and penguins are two kinds of birds that cannot fly.

17. What is this passage about? (Reading for Main idea)

(A) what birds are like (B) why some birds can't fly

(C) where birds have feathers (D) what birds eat

18. What birds can fly? (Reading for Detail)

(A) all birds (B) most birds

(C) some birds (D) only pigeons

Pigs are interesting animals. They have four legs. They have a small tail. They have a round flat nose. Their noses are called a snout. They make funny sounds. They grunt and squeal. They lay in the mud to keep cool. A pig will eat almost everything!

19. What does a snout look like? (Reading for Detail)

(A) small and flat (B) round and flat

(C) long and thin (D) big and square

20. What does a pig eat? (Reading for Detail)

(A) corn (B) meat

(C) carrots (D) all of the above

21. What might a pig do if it's hot? (Drawing Inference)

(A) take a shower (B) drink warm water

(C) move into the barn (D) lay in a puddle of mud

People taste different things on different part of the tongue. If something is sweet, like candy, we taste it on the tip of our tongue. If something is salty, like potato chips, we taste it just behind the tip. If something is sour, like lemon, we taste it on the side of our tongue. We taste bitter things, like dark chocolate, at the back of our tongue.

22. What is the main point of this message? (Reading for Main Idea)

(A) Our tongues have many different sides.

(B) We taste sour things on the sides of our tongue.

(C) We taste different things on different part of our tongue.

(D) We taste sweet things on the tip of our tongue.

The butterfly is a beautiful insect. It has four thin wings. The wings can have many different colors on them. As a butterfly gets older, the colors on its wings fade. Butterflies live all over the world. Most butterflies live where it is very warm and not to dry.

23. Where do most butterflies live? (Reading for Detail)

(A) in hot places

(B) in cool, dry places

(C) in warm places that are not too dry

(D) in sunny places

Trees have three parts. The roots pull up water and food for the tree from underground. The trunk is the stem of the tree. It has bark on it. It helps food get to the branches. The crown is at the top of the tree. Branches, leaves, seeds and flower are all part of the crown.

24. What is the passage about? (Reading for Main idea)

(A) what trees eat

(B) how trees grow

(C) the parts of a tree

(D) what tree like

25. If the tree has no roots, what happens? (Drawing Inference)

(A) It cannot eat.

(B) It can grow fast.

(C) It has more branches.

(D) It has more leaves.

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26. What is the main idea of the notice?

(Reading for main idea)

(A) Tours and Travel to Hawaii

(B) Study in Hawaii

(C) Worldwide Education

(D) Graduates needed in Hawaii

All over the country people go out to play their favorite sports on the weekend. They play tennis or golf, go bowling, or go boating. These people say that it makes them feel good to play a sport. They feel more alive. Others prefer to stay at home. Their idea of a sport is to watch the game on television or to read a book. They say that they have more fun sitting down.

27. What's the main idea of the above passage? (Reading for main idea)

(A) Some people play sport, but others don't.

(B) Everyone feels more alive playing some kinds of sports.

(C) Some people watch sports on TV or read a book for enjoyment.

(D) Watching a game on TV is more enjoyable than going out to play it.

<u>In a pot</u> : Warm the teapot with hot water and empty. Put in one teabag for each person. Add fresh boiling water. Leave to infuse for least three minutes before pouring.

<u>In a cup</u> : Put one teabag in a cup (200 cc.). Add fresh boiling water. Leave to infuse for 2-3 minutes, or to taste. Add sugar, milk or lemon to taste.

28. What would be a suitable headline for this passage? (Reading for main idea)

(A) To make perfect tea (B) Making tea for a pot

(C) How to make a cup of tea (D) Tea for a group

29. Three friends have come to visit. How many teabags should you place in the teapot so that all of you including yourself can have a cup? (Drawing Inference)

(A) one (B) two

(C) three (D) four

30. According to the last sentence, _____. (Drawing Inference)

(A) add the lemon last

(B) sugar should be added before milk or lemon

(C) you should taste the sugar, milk, or lemon before add it

(D) it's up to you how much sugar, milk, or lemon is to be added

Part II : Read the following passage and do as directed below.

Goldfish

Goldfish make the best pets for three reasons. First of all, goldfish are very quiet. They don't bark, howl, meow, chirp, squawk, screech, or race around the house at night while you and your neighbors are trying to sleep. Second, they are economical. You can buy a goldfish at your local pet store for about 50¢, and a small bowl for it costs less than $3.00. Water is practically free. Also, they eat only a pinch of dried fish food daily, so their food bill is quite low. Third, goldfish are very well behaved. They don't have teeth, so they can't chew your furniture or bite your guests. They don't go ever outside, so they can't dig holes in your garden. In addition, you don't have to spend hours teaching them commands such as "Sit!" or "Heel!" If you want a quiet and economical pet that doesn't cause any trouble, visit your nearest goldfish store.

The following statements are some information taken from the passage. Put the letter "O" if it's an opinion. And put the letter "F" if it's a fact.

_____ 1) Goldfish are very quiet animals.

_____ 2) Goldfish don't disturb around the house at night while you and your neighbors are trying to sleep.

_____ 3) Goldfish are economical animals.

_____ 4) You can buy a goldfish at your local pet store for about 50¢, and a small bowl for it costs less than $3.00.

_____ 5) Water is practically free.

_____ 6) Goldfish eat only a pinch of dried fish food daily.

_____ 7) So Goldfish's food bill is quite low.

_____ 8) Goldfish are very well behaved.

_____ 9) Goldfish don't have teeth to chew your furniture or bite your guests.

_____ 10) Goldfish don't go ever outside, so they can't dig holes in your garden.

APPENDIX B

The jigsaw II activities of Mattayom Suksa 1 students

at Watlaemsuwannaram Municipality School

This one lesson plan of jigsaw II (Topic “Animals”) focused on the ability of students to read for main idea. There were 25 volunteer students from Mattayom Suksa 1 for this study. Students were divided into groups of five. There were a total of 5 groups. Each group consisted of one high achiever, three average achievers, and one low achiever. Before learning took place through jigsaw II technique, students were instructed how to follow the activity of jigsaw II. Then, the researcher taught students the following steps.

Activity

Step 1 Reading **Period : 1**

Material needed : an expert sheet **Time : 30 minutes**

Students sat in a group of five. In jigsaw II, this group was called the “home team”. Then, the researcher passed out an expert sheet for each student. In jigsaw II, an expert sheet was is the reading material. The topic of the expert sheet was “Animals” consisting of five subtopics: Bats, Ducks, Whales, Elephants, and Walking Fish. These subtopics were called “expert topics”. The researcher went to each team and pointed out which students were to take which expert topic. When students had their expert topics, they were assigned to read by skimming their information in the expert topic for five minutes. This forced them to see big picture on their information.

Step 2 Expert-Group Discussion **Period : 1**

Time : 30 minutes

The researcher had all students with the expert topic “Bats” get together at one table, all students with expert topic “Ducks” at another table, and so on. There were five groups of expert topics. In jigsaw II, these groups are called the “expert group”. Then, the researcher

assigned a leader for each group. The leader's job was to moderate the discussion, call on group members who raised their hands and tried to see that everyone participated. Before reading, the researcher gave each expert group a question on "what the main point of the story is". Then, each expert group was given about thirty minutes to discuss their expert topics. The researcher had students tried to read silently by scanning the information on their expert topics, and then let them share this information with the group members. Group members took notes on all points discussed. While the expert groups were working, the researcher spent time with each group to answer questions and resolve misunderstandings. The discussion leader was reminded to make sure that everyone participated as well.

Step 3 Team Report **Period : 2**

Time : 35 minutes

After students had finished discussing their expert topics, the researcher had them return to the table of their home teams. Each team member was given five minutes to present information on the expert topic. The researcher let students try to review everything they had learned about their expert topics from their reading and discussion in the expert groups. Each team member had the responsibility of being a good reporter and a good listener. For example, a team member who had the expert topic "Bats" had to present all the points of Bats as well as listening to the rest of the expert topics (Ducks, Whales, Elephants, and walking Fish) from other teammates. After all teams had finished reporting, the researcher asked students questions to check if they understood information covering all five expert topics correctly. They were then ready to take a quiz.

Step 4 Quiz **Period : 2**

Material needed : Individual Quizzes **Time : 25 minutes**

The researcher had students sit at an individual table. Each student was given an individual quiz to test reading for main idea that covered all the five expert topics they learned. The researcher gave students about fifteen minutes to do the quizzes. After that, the researcher had students exchange quizzes with members of other teams for scoring. The researcher and students answered quizzes together. Then, students did the scoring and put their names as a checker at the bottom of the quizzes they checked. After class, the researcher checked each student' scores again to be sure that students did a good job of checking friends' quizzes.

Step 5 Team Recognition

Before starting the next lesson, the researcher announced the individual scores and team scores. The highest scoring team was the most successful team and was given animal dolls as a reward.

The details of the jigsaw II steps that the researcher explained above were only one example of lesson plans used in this study.

Expert Sheet

Topic 1 : Animals

Bats

Bats have fur mostly all over, but not on their wings. Some bats have black, brown, red, or yellow fur. These live in dark places, like caves. Other bats live in trees. Many of these bats are part white and part another color. Some of them are green.

In the day, bats hang by their feet and sleep a lot. At times they clean their fur. Some of the time they care for their babies. Mostly they sleep. But when the sun goes down, they begin to move. At night, bats fly around. They try to find food. Bats eat fruit, bugs, plants, fish, and flowers.

Some bats use their good hearing to find things in the dark. First they make sounds. The sounds jump off anything around the bats. Then these sounds come back, so the bats can hear just where the thing is. They can fly right to it. That's how they find things to eat.

Ducks

Ducks stay in the water most of the time. Their big feet help them swim well. But they are not very good at walking. Ducks making their way along the ground can look very funny.

As ducks swim, they put their heads under water. This is how they look for food. Ducks eat small water animals and bugs. They like some kinds of birds, too. So you see ducks eating grasses, weeds, or even parts of a flower.

Ducks can fly. In this way they are like most other birds. When winter comes, ducks fly to places that aren't cold. Sometimes they must fly very far to get to their winter homes. They stay there until winter ends. Then they fly back to where they came from.

Baby ducks can run, swim, and find food right from the very start of their lives. They grow fast. Soon they can fly. A mother duck keeps her babies together. This way, she can make sure that other animals don't hurt them. You may have seen a mother duck in the water with her little ones swimming after her in a line. It is really something to see!

Whales

Whales are interesting animals. They are big sea animals that look like fish. They have bodies that are made for swimming. Whales have a lot of body fat that helps them keep warm. It also makes their bodies smooth.

These animals move well through the water. But they are not fish. A fish's tail goes from side to side. A whale's tail goes up and down. Whales don't lay eggs like fish. A baby whale's grows inside the mother's body before it is large. Baby whales also have hair and drink milk from their mother.

Most whales are very big animals. One kind called the blue whale is the biggest animal that has ever lived. Blue whales may grow up to 100 feet long. Some kinds of whales are much bigger. These grow only 10 to 15 feet long.

Elephants

The elephant is a big animal with four legs. Elephants live on land. They have great big ears and great big noses. An elephant's nose is called a trunk. It is the longest nose of any animal.

An elephant uses its trunk as if we use our arms and hands. With its trunk, an elephant can bend down and pick food off the ground. With their trunk, elephants can find the new leaves at the top of a tree. An elephant can also lift as many as ten children off the ground with its trunk!

An elephant uses its trunk to take a bath, too. It fills its trunk with water. Then it hoses itself down. What a wonderful way to get clean. Sometimes elephants use their trunk to swim. As they move in the water, they hold their trunks up. This way, they can take in air.

Elephants blow their trunks like horns. Sometimes an elephant will blow sounds to tell other elephants that lions or tigers are coming too close. Other times they make noises to find one another.

Walking Fish

Some people visiting India first told about the walking fish. What was the fish doing in that tree? How did it get there? They thought a bird might have put it there.

But the next day they were surprised again. They saw the fish come out of the water. It was hard to believe, but up the road it went. The fish used its fins and tail to push itself along. It stopped to eat worms. Afterwards, it walked over to a tree. Up, up, up it went. When it got high in the tree, it rested. The people couldn't wait to tell others about this strange fish.

They told how it looked. The walking fish was not too big, they told the others. The one they saw was under a foot long. It was dark brown in color and had spots. They also noticed that it had big eyes. The people heard this story thought it must be funny to see a fish walk along the bank while people were swimming in the water.

Individual Quiz

Topic 1 : Animals (Reading for main idea)

Name.....Team.....

Time : 20 minutes Score : 10 marks

---

1) What is the best main point of "Bats" story ?

a. the birth of bats

b. the food of bats

c. the hearing of bats

d. the characteristics of bats

2) The "Ducks" story mainly tells about _____.

a. the lives of ducks

b. the kinds of ducks

c. the prices of ducks

d. the homes of ducks

3) The passage of "Whales" is mainly about _____.

a. the interesting body of whales

b. how a mother whale feeds its baby

c. whales are big sea animals that look like fish

d. whales and fish differ in many ways

4) What is the main idea of “Elephants” story?

a. the uses of an elephant’s trunk

b. the length of an elephant’s trunk

c. the growth of an elephant’s trunk

d. the strength of an elephant’s trunk

5) According to “Walking Fish” story, the author focuses on _____.

a. a strange fish was caught by a bird

b. why a strange fish was caught in a yard

c. a strange fish moved to make people happy

d. how a strange fish moved to get its food

.....

APPENDIX C

Table of students' pretest and post-test on reading comprehension subskills

before and after being taught by using jigsaw II technique of Mattayom Suksa 1 students

A Comparison of Pretest and Posttest on Reading for Main Idea (N=25)

No.	Students	Pretest (10 points)	Posttest (10 points)	D	D^2
1	Student No.1	3	2	-1	1
2	Student No.2	5	4	-1	1
3	Student No.3	3	2	-1	1
4	Student No.4	4	3	-1	1
5	Student No.5	0	4	4	16
6	Student No.6	3	3	0	0
7	Student No.7	4	5	1	1
8	Student No.8	3	3	0	0
9	Student No.9	2	3	1	1
10	Student No.10	2	4	2	4
11	Student No.11	2	2	0	0
12	Student No.12	2	2	0	0
13	Student No.13	1	4	3	9
14	Student No.14	6	7	1	1
15	Student No.15	5	5	0	0
16	Student No.16	4	5	1	1
17	Student No.17	3	5	2	4
18	Student No.18	0	3	3	9
19	Student No.19	3	3	0	0
20	Student No.20	2	4	2	4
21	Student No.21	3	2	-1	1
22	Student No.22	4	6	2	4
23	Student No.23	4	6	2	4
24	Student No.24	1	2	1	1
25	Student No.25	2	4	2	4
		Σ		**22**	**68**

t-test dependent $= \dfrac{22}{\sqrt{\dfrac{25(68)-(22)^2}{25-1}}}$

$= 3.091$

A Comparison of Pretest and Posttest on Reading for Detail (N=25)

No.	Students	Pretest (10 points)	Posttest (10 points)	D	D^2
1	Student No.1	8	5	-3	9
2	Student No.2	4	8	4	16
3	Student No.3	7	7	0	0
4	Student No.4	9	6	-3	9
5	Student No.5	6	2	-4	16
6	Student No.6	3	6	3	9
7	Student No.7	7	8	1	1
8	Student No.8	8	5	-3	9
9	Student No.9	10	10	0	0
10	Student No.10	7	8	1	1
11	Student No.11	3	7	4	16
12	Student No.12	3	3	0	0
13	Student No.13	3	7	4	16
14	Student No.14	8	9	1	1
15	Student No.15	7	8	1	1
16	Student No.16	9	8	-1	1
17	Student No.17	2	8	6	36
18	Student No.18	6	1	-5	25
19	Student No.19	6	6	0	0
20	Student No.20	7	6	-1	1
21	Student No.21	2	5	3	9
22	Student No.22	10	8	-2	4
23	Student No.23	7	8	1	1
24	Student No.24	3	10	7	49
25	Student No.25	7	9	2	4
Σ				**16**	**234**

t-test dependent $= \dfrac{16}{\sqrt{\dfrac{25(234)-(16)^2}{25-1}}}$

$= 1.048$

A Comparison of Pretest and Posttest on Drawing Inference (N=25)

No.	Students	Pretest (10 points)	Posttest (10 points)	D	D^2
1	Student No.1	6	5	-1	1
2	Student No.2	4	7	3	9
3	Student No.3	5	7	2	4
4	Student No.4	7	8	1	1
5	Student No.5	3	6	3	9
6	Student No.6	9	6	-3	9
7	Student No.7	4	7	3	9
8	Student No.8	6	5	-1	1
9	Student No.9	8	10	2	4
10	Student No.10	6	9	3	9
11	Student No.11	3	4	1	1
12	Student No.12	7	6	-1	1
13	Student No.13	6	7	1	1
14	Student No.14	6	9	3	9
15	Student No.15	9	7	-2	4
16	Student No.16	9	8	-1	1
17	Student No.17	6	7	1	1
18	Student No.18	3	5	2	4
19	Student No.19	6	8	2	4
20	Student No.20	5	8	3	9
21	Student No.21	3	5	2	4
22	Student No.22	5	8	3	9
23	Student No.23	6	9	3	9
24	Student No.24	6	7	1	1
25	Student No.25	6	6	0	0
Σ				**30**	**114**

t-test dependent $= \dfrac{30}{\sqrt{\dfrac{25(114)-(30)^2}{25-1}}}$

$= 3.328$

A Comparison of Pretest and Posttest on Differentiating between Fact and Opinion (N=25)

No.	Students	Pretest (10 points)	Posttest (10 points)	D	D^2
1	Student No.1	8	7	-1	1
2	Student No.2	8	8	0	0
3	Student No.3	6	8	2	4
4	Student No.4	8	10	2	4
5	Student No.5	7	7	0	0
6	Student No.6	7	7	0	0
7	Student No.7	9	5	-4	16
8	Student No.8	1	7	6	36
9	Student No.9	5	5	0	0
10	Student No.10	8	7	-1	1
11	Student No.11	6	5	-1	1
12	Student No.12	4	7	3	9
13	Student No.13	8	5	-3	9
14	Student No.14	7	6	-1	1
15	Student No.15	7	8	1	1
16	Student No.16	7	9	2	4
17	Student No.17	7	8	1	1
18	Student No.18	5	8	3	9
19	Student No.19	7	8	1	1
20	Student No.20	9	7	-2	4
21	Student No.21	7	3	-4	16
22	Student No.22	7	8	1	1
23	Student No.23	4	8	4	16
24	Student No.24	8	6	-2	4
25	Student No.25	5	7	2	4
		Σ		**9**	**143**

t-test dependent $= \dfrac{9}{\sqrt{\dfrac{25(143)-(9)^2}{25-1}}}$

$= 0.746$

APPENDIX D

Table of students' achievement on reading comprehension

before and after being taught by using jigsaw II technique of Mattayom Suksa 1 students

A comparison of Pretest and Posttest on Reading Comprehension (N=25)

No.	Students	Pretest (10 points)	Posttest (10 points)	D	D^2
1	Student No.1	25	27	2	4
2	Student No.2	21	27	6	36
3	Student No.3	21	24	3	9
4	Student No.4	28	37	9	81
5	Student No.5	16	19	3	9
6	Student No.6	22	22	0	0
7	Student No.7	24	25	1	1
8	Student No.8	18	20	2	4
9	Student No.9	25	28	3	9
10	Student No.10	23	28	5	25
11	Student No.11	14	18	4	16
12	Student No.12	17	18	1	1
13	Student No.13	18	23	5	25
14	Student No.14	27	31	4	16
15	Student No.15	28	28	0	0
16	Student No.16	29	30	1	1
17	Student No.17	18	28	10	100
18	Student No.18	14	17	3	9
19	Student No.19	22	25	3	9
20	Student No.20	23	25	3	9
21	Student No.21	15	15	0	0
22	Student No.22	26	30	4	16
23	Student No.23	21	31	10	100
24	Student No.24	18	25	7	
25	Student No.25	20	26	6	
Σ				**95**	**565**

t-test dependent $= \dfrac{95}{\sqrt{\dfrac{25(565)-(95)^2}{25-1}}}$

$= 6.517$

VITAE

VITAE

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	Srisaketwittayalai School, Srisaket
2005	Bachelor of Education (English)
	Chandrakasem Rajabhat University, Bangkok
2012	Master of Arts (Teaching English
	as a Foreign Language)
	Srinakharinwirot University, Bangkok