The Reciprocal Teaching Procedure:
An Alternative Reading Instruction that Works

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Abstract

The Reciprocal Teaching Procedure (RTP) has been proven to be effective for helping first and second language readers improve their reading. To date, no empirical study has determined whether the RTP could be effective for improving EFL high school students' reading performance. The purpose of this study was to investigate the effects of the RTP on Thai high school students' English reading performance in responding to text-explicit, text-implicit and script-implicit questions and their attitude towards the RTP. The participants were 44 tenth grade students studying at a high school in Northern Thailand. They received a fifty-minute-training session twice a week for 14 weeks and were measured for question response accuracy using six reading performance tests. An attitude questionnaire and interviews were conducted after the intervention. The data from the reading tests were analyzed using multivariate analysis with testing time as the repeated dimension. The results indicated that the RTP appeared to positively affect Thai high school students' English reading performance in responding to text-explicit, text-implicit and script-implicit questions. The questionnaire and interview results demonstrated that the RTP helped

improve their reading performance and that the students had positive attitudes towards the RTP.

Introduction

In Thailand, students are not able to read and understand English texts at the expected level even though they have learned English for several years. The results from national and international tests consistently show the English reading ability of Thai students was considerably lower than that expected (Saiyasombut, 2012). Being unable to apply reading strategies effectively is one of the factors that account for this (Adunyarittigun & Pidchamook, 2013).

The Reciprocal Teaching Procedure (RTP) is a metacognitive strategy instruction that guides students to learn specific, concrete, comprehension-fostering and comprehension-monitoring strategies including their application within a social, supportive and challenging context (Palinscar & Brown, 1984). The strategies taught and practiced in the RTP are predicting, questioning, clarifying and summarizing. This procedure is undertaken within a social, supportive and challenging context where dialogue is used as a mechanism for learning and practicing the strategies.

The RTP is effective for improving reading ability because the RTP contains four selected effective reading strategies which help students enhance and monitor their comprehension and thinking (Palincsar & Brown, 1984). Many forms of scaffolding are used to guide, model and foster students' comprehension such as activating prior knowledge, modeling, asking questions, explaining, etc. Importantly, students are given opportunities to have social interaction, share ideas, build confidence, and learn from their peers. These help

enhance students' ability to resolve comprehension difficulties, attain a high level of thinking, improve metacognition, and build motivation.

A lot of studies have been conducted to provide empirical proof to confirm the effectiveness of the RTP in an L1 context (Lysynchuk, Pressley, & Vye, 1990; Palincsar & Brown, 1984; Taylor, Frye, Short, & Shearer, 1992), in an L2 context (Hansan, 1994; Okkinga, Steensel, Gelderen, & Sleegers, 2018; Song, 1998; Zhang, 2008), and in Thailand (Adunyarittigun, 1998; Soonthornmanee, 2002; Soranastastaporn & Ratanakul, 2000; Wisaijorn, 2003; Yoosabai, 2009). The majority of the studies in Thailand were conducted with college-aged students. However, little is known about the effectiveness of the RTP on the reading performance of EFL high school students. The purpose of this study was to investigate the effects of the RTP on Thai high school students' English reading performance in responding to text-explicit, text-implicit and script-implicit questions and to investigate the students' attitude toward the RTP. The research questions were:

1. What are the effects of the RTP on Thai high school students' English reading performance in responding to text-explicit, text-implicit and script-implicit questions?

2. What are Thai high school students' attitude towards the RTP?

Literature Review
The Reciprocal Teaching Procedure (RTP) and Its Theoretical Framework

The Reciprocal Teaching Procedure or "the Fab Four" (Oczkus, 2018) is an instructional method designed to teach students four effective cognitive reading strategies: predicting, clarifying, questioning and summarizing. The reading strategies are actively and consciously used to support comprehension, serve dual purposes of being comprehension-fostering and comprehension-monitoring, and assist

students to get away from cognitive failure or comprehension breakdown (Palincsar & Brown, 1984; Slater & Horstman, 2002). Initially, a teacher asks students to actively make use of their background knowledge to hypothesize what they are going to read (Ahmadi, Ismail, & Abdullah, 2013; Doolittle, Hicks, Triplett, Nichols, & Young, 2006). When unclear concepts, unfamiliar vocabulary, or complex English structures are encountered, the students will be trained on how to utilize certain strategies to decode or to deal with reading problems. Next, the students are guided to ask three levels of questions: textually explicit, textually implicit and scriptally implicit questions. Questioning helps the students metacognitively monitor and assess their own understanding of the text (Doolittle et al., 2006). Also, the students are required to identify important information within a text and synthesize these into a clear and concise statement (Palincsar & Brown, 1984). This procedure is undertaken within a social, supportive and challenging context. The instruction firstly takes place between the teacher and the students and then between the students themselves (Adunyarittigun, 1999; Oczkus, 2018; Yoosabai, 2009).

The RTP can be effective for helping second language readers and struggling readers become self-regulated readers because of these reasons (Adunyarittigun, 1998, 1999). First, the RTP consists of four well-selected reading strategies which provide the dual function of enhancing comprehension and of monitoring comprehension (Palincsar & Brown, 1984). The readers are asked to hypothesize the text and also make predictions from clues available in the text. When they do not understand texts, they will be able to get clarification about the text from peers or teachers. Summarizing will help readers monitor and review their understanding. Questioning can also help them monitor and recheck their understanding of the text.

Second, the readers can learn and develop their problem-solving skills for reading in the RTP. The readers vicariously learn and practice

how to implement the four effective reading strategies in groups. They observe how teachers and peers do problem solving when they have reading problems, such as using fix-up strategies, making use of context clues to figure out word meanings, seeking relevant background information to help understand concepts in "unfriendly, inconsiderate texts" (Palincsar & Brown, 1984).

Third, the readers will become actively engaged in reading through dialogue. Dialogue which becomes an important mechanism of the RTP is used for sharing clarifications, giving important background information relevant to texts, and explaining linguistic concepts in the texts.

Finally, the RTP can promote second language readers' or struggling readers' self-perception to read and motivation to read (Adunyarittigun, 1998, 1999). In the RTP, these readers can practice utilizing the four effective reading strategies in an active and supportive environment. Support and scaffolding are offered in different forms such as asking questions, clarifying unclear concepts, modeling and demonstrating how to fix reading problems, leading them to being capable of performing the reading task independently. The readers are motivated to take risks making meaning from reading and experience reading success.

The RTP is framed by Vygotskian sociocultural theories which include: Zone of Proximal Development (ZPD) (Vygotsky, 1978), proleptic teaching (Rogoff & Gardner, 1984), and expert scaffolding (Wood, Bruner, & Ross, 1976). First, within the Zone of Proximal Development, the process of learning is distributed between a more capable learner and a less capable learner (Lantolf & Appel, 1994; Vygotsky, 1978; Wertsch, 1985). The less capable learner learns how to perform a task and internalizes how to utilize the reading strategies to do problem solving effectively from the more capable learner through dialogues.

Second, the RTP is also informed by the proleptic teaching (Rogoff & Gardner, 1984). Proleptic means teaching in anticipation of competence (Palincsar & Brown, 1984) and refers to the teaching circumstance where the novice learner takes part in constructing contextual knowledge of performing a certain task under expert guidance and acquires the expert's strategies for solving problems (Rogoff & Gardner, 1984). The more capable learner gradually reduces his or her role and transfers his or her responsibility from the more capable learner to the less capable learner until the less capable becomes a self-regulated learner.

Finally, expert scaffolding is another sociocultural theory which undergirds the RTP. A novice learner can use scaffolding as a process to enable them to solve a problem or perform a task with assistance (Wood et al., 1976). In the RTP, a teacher provides students with how to use the four reading strategies and how to solve their reading problems. Many forms of support from a teacher and more capable students, such as demonstration, clarification, asking questions and feedback, are given to less capable students through dialogues.

Previous Research Related to the RTP

Several research studies in L1 have been conducted to prove the effectiveness of the RTP on the improvement of students' reading ability. The seminal work by Palincsar and Brown (1984) revealed that the seventh-grade students responded very well to the RTP and that the RTP was effective and worked well when the students were not able to comprehend texts but did have adequate decoding ability. Besides, it is notable that researchers have developed the means of teaching the RTP into two approaches and have proven the effects of each on L1 readers' reading ability. These approaches are the Explicit Teaching-Reciprocal Teaching (ET-RT) and the Reciprocal Teaching Only (RTO). In the ET-RT approach, the four reading strategies are taught explicitly before dialogues about texts between the teacher and

the students and the students themselves take place. In contrast, the four reading strategies are taught implicitly during the dialogues in the RTO. Lysynchuk et al. (1990) and Taylor et al. (1992) conducted studies to prove the effects of the ET-RT on the reading ability of fourth-grade Canadian students and seventh-grade students, respectively. Their studies clearly uncovered that the ET-RT approach improved the reading comprehension of the students. In addition, Weedman (2003) investigated whether there was a significant difference between the ET-RT and the RTO on high school students in the US. Her study demonstrated that there was no statistically significant difference between the two approaches. Bruce and Robinson (2004) integrated word identification strategies into the RTP in order to help poor decoders improve their decoding skill and comprehension. Their study indicated that the modified RTP with the integration of the word identification was effective and helped the poor decoders develop their reading comprehension quickly after a few weeks of the intervention.

The RTP has been implemented and proven its effectiveness in the L2 context (Hansan, 1994; Okkinga et al., 2018; Song, 1998; Zhang, 2008). It is notable that the RTP was effective for training L2 students when the cognitive strategies of the RTP were taught explicitly (Hansan, 1994; Song, 1998). In other words, L2 students needed to be competent utilizing the four reading strategies to process their reading before they could discuss texts. Okkinga and her colleagues (2018) also suggested that the teacher who directed the RTP should be extensively trained on the RTP. This would contribute significantly to the effectiveness of the RTP.

In addition, studies investigating the RTP in Thailand have been conducted with college-aged students and found that the RTP contributed to the improvement of the college-aged students' reading ability (Adunyarittigun, 1998; Ratanakul, 1997; Soonthornmanee, 2002; Supasorn, 2013; Wisaijorn, 2003). Besides reading ability, some

also revealed the positive effects of the RTP on the students' self-perception to read (Adunyarittigun, 1998) and the students' attitudes towards the RTP (Supasorn, 2013; Wisaijorn, 2003).

Research Methodology
Participants

The design of this study was one group design without a control group. A class (30 female students and 14 male students) of Grade 10 Thai high school students studying at a public school in a province of the northern part of Thailand was randomly selected from a pool of fourteen classes to participate in the study. Over eighty percent of the students in this class reported that they have been studying English for over 12 years. The students in this study were like mainstream Thai students in public schools. The core curriculum designed by the Ministry of Education was implemented. Fifty-seven percent of the students received scores in the Ordinary National Education Test (O-NET) for English subject at Grade 9 within the range of 60% - 69%. In addition, the mean score obtained from the reading section of the Examination for the Certificate of Competency in English (ECCE) Michigan Test 2017 was 16.18 (SD = 3.83) out of 30, revealing that the students in this study could read and understand short, simple texts containing the highest frequency vocabulary (A2).

The students enrolled in a course called English Reading II (ENG31102) in the second semester of the academic year 2017. The course is designed to develop Thai high school students' reading strategies, vocabulary skills and reading comprehension. It provides the students with reading practices through various activities for reading English texts. The course book titled *New Weaving It Together Books 1* (CEFR: A2) is used in this course. The reading passages in the book represent a variety of topics such as food, inventions, people, history, and reading from literature. The students received the reading

instruction based on the RTP and were required to attend a fifty-minute class, twice a week.

In addition, nine students were randomly selected to be interviewed. The students in this study were clearly informed about the study and were asked to sign a written consent form. They participated in this study on a voluntary basis and were able to withdraw their participation from the study at any time.

Teacher

A 32-year-old English native speaking teacher with 8 years of teaching experience participated in this study. The teacher held a bachelor's degree in Science from a university in the UK and a TEFL (Teaching English as a Foreign Language) certificate. The teacher received three two-hour training sessions on how to implement the RTP by the researcher including important information about the study such as an overview of the study, the purpose of the study, materials and instruments, and procedures in the study. Prior to the present study, a pilot study was carried out to validate the RTP conducted by the teacher. All sessions of the pilot study were observed and video-recorded by the researcher to ensure that the RTP was followed. An expert on the RTP was asked to view a sample of video clips to validate that the RTP was appropriately followed. It should be noted that the teacher used English as the medium of instruction. At the beginning of the study, when the researcher observed classes and found that the students did not understand the lessons in English, the researcher would help explain in Thai.

Research Instruments

The ECCE Michigan Test. The reading section of the Examination for the Certificate of Competency in English (ECCE) Michigan Test 2017 was used in this study to measure the students' reading ability in English, giving the baseline information about the students' reading ability. The reading section consists of 30 multiple

choice questions. Part 1 includes 2 short reading passages with 5 comprehension questions each. Part 2 consists of 2 short texts with 10 comprehension questions each. According to the Kuder-Richardson Formula 20, the reliability in section 3 is .93. The test is considered as having high internal consistency.

Student Information Questionnaire. The Student Information Questionnaire was developed to gather information about students' demographic information, experience in studying English and their English reading background.

Reading Performance Tests. Six alternate forms of the reading performance tests were drawn from a series of daily performance tests developed by Palincsar and Brown (1984). The tests were used to assess the reading comprehension ability. Each form of the reading performance tests consisted of a passage of 400-475 words with 10 questions. Four questions were text-explicit questions. The students were required to read quickly in order to locate important information from a single sentence of the text to answer the questions (Pearson & Johnson, 1978). Four were text-implicit questions. The students were required to read and integrate information from multiple sentences in the text to answer the questions. The other two were script-implicit questions. The students were needed to integrate their relevant background knowledge with the information in the text to answer the questions. Scoring of the tests was done by two independent raters. The inter-rater reliability ranged from .88 to .96, indicating a high degree of consistency between the two raters.

Lesson Plans for Introducing Reading Strategies. Two lesson plans were developed to introduce the four strategies. The first lesson plan was meant to introduce predicting and clarifying, and the second was intended to introduce questioning and summarizing. The reading materials used to introduce the RTP strategies were developed by Palincsar and Brown (1984) and were drawn from different subject

matters including sciences, social studies, history and nutrition. The lessons started with single and simple sentences and then moved to more complex sentences and finally to paragraphs.

Lesson Plans for the RTP. Eight lesson plans were developed from the RTP framework in order to help the students make use of the RTP strategies. Eight reading passages were taken from a course book titled *New Weaving It Together Books 1* by Milada Broukal (CEFR:A2) used for teaching 10th graders. The passages covered various topics such as food, inventions, people and literature. The lesson plans consisted of three important stages: modeling, participation and cooperative learning. The students were taught how to make use of clues from texts to make predictions, to generate questions, to solve their problems with word meanings, sentence structures or concepts, and to summarize.

Attitude Questionnaire. The attitude questionnaire developed by Wisaijorn (2003) was used to collect the students' attitude toward the RTP. It consisted of 17 items, using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Semi-Structured Interviews

Semi-structured interviews were used to solicit the students' attitude towards using the RTP, problems encountered and suggestions. The interviews were conducted in Thai so as to facilitate the students' understanding and responses. The interviews were recorded, transcribed and verified by the students to check the accuracy of the transcription.

Procedure

At the beginning of the study, an intact class of forty-four students was asked to complete the Student Information Questionnaire, the ECCE Michigan Test and the Reading Performance Test 1 to obtain their demographic information and the baseline data of their reading ability in English. The tests were administered by the teacher under the supervision of the researcher. Then, the students received training

on how to apply the four strategies in the RTP. The first two lesson plans were implemented to introduce the four strategies: predicting, clarifying, questioning, and summarizing. In this session, the students were told that they would learn four effective reading strategies which would help them to be better readers in English. The teacher and the students discussed the benefits of each strategy and considered where, when, and how to use the strategies.

After the four sessions of training in the four strategies, the students were more familiar with the reading strategies. Then, the teacher explicitly explained the RTP to the students. At this stage, the eight lesson plans for the RTP were implemented in three stages.

Stage 1. Modeling. The teacher modeled and demonstrated how to use the strategies before, during and after reading.

Stage 2. Participation. At this point, the teacher acted as the discussion leader. He asked the students to examine the title, activate their background knowledge about the text, make predictions based on the title, and ask the students to read the first paragraph silently. The students were asked questions about important information in the paragraph and were asked to locate the answers and summarize the main point of the paragraph. Besides, the teacher as a discussion leader could either help clarify or ask the students to do problem solving in terms of clarifying confusing points about vocabulary or sentences. The teacher asked the students to make predictions and elaborate their predictions about next paragraph and then asked one of the students to take turns leading the discussion following the RTP. The procedure was repeated.

Stage 3. Cooperative Stage. The students were divided into 9 groups with 4-5 members each after they were familiar with the RTP. Each student took turns taking the role of discussion leader and directing the group members to follow each step of the RTP. Some students might act as leader more than once depending on the length of the

passage. The students were allowed to use their native tongue for discussion. This helped facilitate their discussion and reduce their stress and anxiety when they had to handle English texts (Adunyarittigun, 1999).

While the students were discussing in small groups, the teacher was observing his students' performance and also providing the students with different forms of support such as asking questions, making suggestions, clarifying the students' concerns, and giving feedback about the quality of the students' questions, predictions and summaries.

The students took the reading performance tests in weeks 1, 4, 8, 10, 13 and 14, and the attitude questionnaire was administered at the end of the program. One student was randomly selected from each of the nine groups to be interviewed at the end of the program to elicit their attitude towards the RTP.

Data Analysis

The data obtained from the 6 reading performance tests were used to answer the first research question. Each test consisted of 4 items of text-explicit questions with a total score of 4 points, 4 items of text-implicit questions with a total score of 4 points and 2 items of script-implicit questions with a total score of 4. A 1(test1-6) X 6 (testing occasions) repeated measures multivariate statistical analysis was applied. The analysis was used to determine statistically significant time differences (6 test occasions). Means and standard deviations were applied to present the accuracy in responding to the three types of question. To confirm whether students improved their reading performance in responding to the three types of question across the testing occasions, each mean of the main effect for 6 testing occasions was compared to the means of the subsequent testing occasions, using Helmert contrasts. All tests of significance were conducted at the .05 level.

The data obtained from the attitude questionnaire and interviews were used to answer the second research question. The data obtained from the attitude questionnaire were analyzed and interpreted using the interpretation key provided by Wisaijorn (2003). Mean and standard deviation were applied. The data from the interviews were analyzed in order to find out the students' attitude towards the RTP and the problems they encountered when they applied the RTP.

Findings and Discussions

Research Question 1: What are the effects of the RTP on Thai high school students' English reading performance in responding to text-explicit, text-implicit and script-implicit questions?

Text-Explicit Questions

With regard to the accuracy in responding to text-explicit questions, the result reveals that the students' reading performance improved. Means and standard deviations are presented in Table 1.

Table 1

Means and Standard Deviations for Accuracy in Responding to Text-Explicit Questions

Test	T1	T2	T3	T4	T5	T6
$\overline{X}$	2.89	3.05	3.27	3.45	3.57	3.61
S.D.	0.58	0.64	0.54	0.50	0.50	0.54

Note: Text-Explicit Questions = 4 items with a total score of 4 points.

As can be seen in Table 1, the accuracy in responding to text-explicit questions in the tests increased from Test 1 to Test 6. The means of the scores gradually increased from 2.89 in Test 1 to 3.61 in Test 6. The test results show that the students developed their accuracy in responding to text-explicit questions over time.

To confirm whether students improved their reading performance in responding to text-explicit questions across the testing occasions, each mean of the main effect for 6 testing occasions was compared to the means of the subsequent testing occasions using Helmert contrasts. Table 2 reveals that the majority of the contrasts for the testing occasions were significant at the .05 level of confidence. Only the contrast between the mean of testing occasion 5 and the weighted mean of testing 5 to 6 was not statistically significant. In addition, the means of the scores on text-explicit questions progressively increased from testing occasion 1 to the latter occasions.

Table 2

Helmert Contrast Test of the Mean Differences for Accuracy in Responding to Text-Explicit Questions across Six Testing Occasions

Testing Occasions	Means	F Value
1 VS 2-6	2.89 VS 3.39	5.202*
2 VS 3-6	3.05 VS 3.48	3.763*
3 VS 4-6	3.27 VS 3.54	4.299*
4 VS 5-6	3.45 VS 3.59	1.859*
5 VS 6	3.57 VS 3.61	0.404

$p < .05$ level

Text-Implicit Questions

With regard to accuracy in responding to text-implicit questions on the tests, the result reveals that students' performance improved. Means and standard deviations are presented in Table 3.

Table 3

Means and Standard Deviations for Accuracy in Responding to Text-Implicit Questions

Test	T1	T2	T3	T4	T5	T6
$\overline{X}$	3.77	4.41	4.89	5.23	6.05	6.45
S.D.	1.13	0.82	1.01	0.86	0.83	0.87

Note: Text-Implicit Questions = 4 items with a total score of 8 points.

The accuracy in responding to text-implicit questions on the tests increased from Test 1 to Test 6 (Table 3). The means of the scores gradually increased from 3.77 in Test 1 to 6.45 in Test 6. The result shows that the students developed their accuracy in responding to text-implicit questions over time.

Table 4

Helmert Contrast Test of the Mean Differences for Accuracy in Responding Text-Implicit Questions across Six Testing Occasions

Testing Occasions	Means	F Value
1 VS 2-6	3.77 VS 5.41	8.743*
2 VS 3-6	4.41 VS 5.65	7.149*
3 VS 4-6	4.89 VS 5.91	8.600*
4 VS 5-6	5.23 VS 6.25	8.345*
5 VS 6	6.05 VS 6.45	2.663*

* p < .05 level

In order to confirm whether students improved their reading performance in responding to text-implicit questions across the testing occasions, each mean of the main effect for 6 testing occasions was

compared to the mean of the subsequent testing occasions in the list through the use of Helmert contrasts. As can be seen in Table 4, the result reveals that the means of the scores on the text-implicit questions were different over the testing occasions. An examination of the mean differences in Table 4 indicates that all of the contrasts for the testing conditions were significant at the .05 level of confidence. The mean scores on the text-implicit questions were different and progressively increased over the testing occasions.

Script-Implicit Questions

With regard to accuracy in responding to script-implicit questions on the tests, the result reveals that students' performance was improved. Means and standard deviations are presented in Table 5.

The accuracy in responding to script-implicit questions on the tests increased from Test 1 to Test 6. The means of the scores gradually increased from 1.84 in Test 1 to 3.23 in Test 6. The result shows that the students developed their accuracy in responding to script-implicit questions over time.

Table 5

Means and Standard Deviations for Accuracy in Responding to Script-Implicit Questions

Test	T1	T2	T3	T4	T5	T6
$\overline{X}$	1.84	2.23	2.25	2.32	2.89	3.23
S.D.	0.64	0.77	0.61	0.67	0.62	0.61

Note: Script-Implicit Questions = 2 items with a total score of 4 points.

Table 6

Helmert Contrast Test of the Mean Differences for Accuracy in Responding to Script-Implicit Questions across Six Testing Occasions

Testing Occasions	Means	F Value
1 VS 2-6	1.84 VS 2.58	8.503*
2 VS 3-6	2.23 VS 2.67	3.484*
3 VS 4-6	2.25 VS 2.81	6.691*
4 VS 5-6	2.32 VS 3.06	7.522*
5 VS 6	2.89 VS 3.23	3.034*

* p < .05 level

To confirm whether students improved their reading performance in responding to script-implicit questions across the testing occasions, each mean of the main effect for 6 testing occasions was compared to the mean of the subsequent testing occasions in the list through the use of Helmert contrasts. Table 6 reveals that all of the contrasts for the testing occasions were statistically significant. An examination of the mean differences indicated that all of the contrasts for the testing conditions were significant at the .05 level of confidence. The finding also reveals that the means of the scores on the script-implicit questions were different and progressively increased over the testing occasions.

All Questions

With regard to accuracy in responding to all questions on the tests, the result reveals that students' performance improved. Means and standard deviations are presented in Table 7.

Table 7 illustrates that the accuracy in responding to all questions on the tests increased from Test 1 to Test 6. The means of the scores gradually increased from 8.50 in Test 1 to 13.29 in Test 6.

The result indicates that the students developed their accuracy in responding to all questions over time.

Table 7
Means and Standard Deviations for Accuracy in Responding to All Questions

Test	T1	T2	T3	T4	T5	T6
$\overline{X}$	8.50	9.68	10.41	11.00	12.50	13.29
S.D.	1.41	1.44	1.21	1.21	1.27	1.09

Note: All Questions = 10 items with a total score of 16 points.

Table 8
Helmert Contrast Test of the Mean Differences for Accuracy in Responding to All Questions across Six Testing Occasions

Testing Occasions	Means	F Value
1 VS 2-6	8.50 VS 11.38	12.672*
2 VS 3-6	9.68 VS 11.80	7.874*
3 VS 4-6	10.41 VS 12.27	12.252*
4 VS 5-6	11.00 VS 12.90	9.742*
5 VS 6	12.50 VS 13.29	3.939*

* p < .05 level

An examination of the mean differences in Table 8 indicates that all of the contrasts for the testing conditions were significant at the .05 level of confidence. The finding suggests that all of the means of the testing scores for all types of questions were incrementally different over the testing occasions. An examination of the mean differences indicates that all of the contrasts for the testing conditions

were statistically significant at the .05 level of confidence. The means of the testing scores on all types of questions were significantly different over the testing occasions.

The results show that the RTP positively affected Thai high school students' English reading performance in responding to text-explicit, text-implicit and script-implicit questions. The results are consistent with previous studies (Freihat & Al-Makhzoomi, 2012; Hou, 2015; Lederer, 2000; Soonthornmanee, 2002; Wisaijorn, 2003; Yoosabai, 2009). This is due to the following reasons. Firstly, the RTP provided the students with comprehension-monitoring and comprehension-fostering strategies. These strategies are metacognitive reading strategies (Palincsar & Brown, 1984). The students receiving training in the RTP could: (1) strategically plan; (2) set their purposes, make predictions, hypothesize what they are going to read, and prove or disprove their predictions; (3) monitor their comprehension and their thinking process; (4) make use of the strategies to solve their problems; and (5) become metacognitively aware of their own thinking and reading process (Adunyarittigun, 1999; Hou, 2015; Palincsar & Brown, 1984). Throughout the study, the students read the title and made use of graphic clues to get the overall idea of the text. They read to prove or disprove their predictions. This motivated them to get engaged in their own reading. Predicting tied in what the students had already known about the topic with what they acquired through reading. It kept the students actively thinking about the text while they were reading (Ahmadi et al., 2013; Duffy, 2002; Lederer, 2000). Clarifying was used when they faced problems. They asked themselves questions to clarify ambiguities, reread the text, consulted their mobile dictionaries or friends, or asked their teacher for help. Clarifying helped them resolve confusion through reading (Ahmadi et al., 2013; Doolittle et al., 2006). While reading, the students also asked three different types of questions: text-explicit, text-implicit and script-implicit questions.

Asking themselves questions enhanced their comprehension and provided them with a context for exploring the text more deeply (Doolittle et al., 2006). Summarizing helped them focus their attention on important information in a text and discount unimportant information (Lysynchuck et al., 1990; Trabasso & Bouchard, 2002).

Secondly, interactions between the teacher and the students and among the students themselves in a friendly environment encouraged the students to get engaged in reading and discussing texts. During reading, the students got engaged in dialogue with the teacher and their classmates. They shared their understanding, helped their classmates clarify questions and also suggested a means of applying the four strategies to solve problems. The discussion helped less capable readers learn and get assistance from more capable readers (Palinscar & Brown, 1984; Jones, 1999; Tinungki, 2015). Dialogues in a friendly learning environment created opportunities for learning for these students and made them gain more confidence and become self-regulated readers (Duffy, 2002; Liu & Bu, 2016; Palincsar & Brown, 1984; Vygotsky, 1978).

Thirdly, scaffolding was used to support learning and build reading ability in the RTP (Graves & Graves, 2003; Pressley, 2002). More capable readers applied scaffolding known as temporary supports to guide and facilitate learning such as questioning, explaining, giving feedback and clarifying. The more capable readers were then able to help less capable readers process what they were reading before they were able to do so unassisted (Peregoy & Boyle, 2016). This allowed less capable readers to improve their reading ability. When less capable readers were able to read and make use of reading strategies to process texts, more capable readers gradually reduced their assistance and their role. The less capable readers could finally develop themselves to become self-regulated readers (Malock, 2002; Tinungki, 2015). It is notable that in this classroom where the RTP took place, the teacher

was not the only one who helped less capable readers move within their Zone of Proximal Development (Vygotsky, 1978). Their peers considered as more capable readers also contributed to assist less capable readers learn how to read and solve reading problems.

It is important to note that in case of the text-explicit questions, the mean of the testing occasion 6 was not significantly higher than that of the testing occasion 5. This could be due to the fact that the students possibly reached their limit in applying the RTP at their level of English competency to accurately respond to the text-explicit questions. The mean score of Test 5 is at what is considered high (3.57) from a maximum score of 4 while the mean score of Test 6 was also high (3.61). Yet, it is possible that the students can develop their ability to respond to text-explicit questions more accurately when they receive more opportunities to practice the RTP and vicariously learn from their peers during discussion.

Research Question 2: What are Thai high school students' attitude towards the RTP?

The result from the first section of the attitude questionnaire reveals that the majority of the students had positive attitudes towards the RTP. As can be seen in Table 9, the results show that the students had positive attitudes towards the RTP (Mean = 4.23, SD = 0.86). They strongly believed that knowing the reading strategies could help them comprehend texts better (Mean = 4.79, SD = 0.76). They also reported that the RTP was helpful in reading texts in English since they were able to utilize the four reading strategies to comprehend texts (Mean = 4.67, SD = 1.22), to solve their reading problem effectively when they read (Mean = 4.57, SD = 0.87) and to activate their prior knowledge and make predictions before they read (Mean = 4.42, SD = 0.75).

Table 9

The Questionnaire Results: Students' Attitudes towards the RTP

No	Items	Mean	SD
1	After I have learned the RTP, I enjoyed reading texts in English when I read with friends.	3.61	0.94
2	After I have learned the RTP, I could comprehend texts in English better when I read with friends.	3.57	0.88
3	Predicting encourages me to think ahead of the content in the texts.	4.18	0.85
4	Predicting activates my prior knowledge and experience before reading.	4.39	0.91
5	Predicting help me comprehend the texts.	4.42	0.75
6	Clarifying helps me solve the problem caused by difficult section in the texts.	4.57	0.87
7	I could guess and clarify meaning of the difficult and unknown words, phrases, or sentences more correctly.	4.36	0.92
8	Summarizing focuses my attention on the main idea and important information in the texts.	4.11	0.86
9	After I have learned the RTP, I usually have no problem in finding the main idea.	4.22	0.92
10	Generating questions helps me check my own understanding on the main idea and important information in the texts.	4.27	0.79
11	The RTP is easy to follow.	3.79	0.84
12	I think the RTP strategies help me comprehend the texts.	4.67	1.22
13	Using the RTP strategies is fun.	4.23	0.82
14	The more I practice the RTP, the easier I can read and understand texts.	4.29	0.79
15	After having finished the RTP training, I become better at reading comprehension.	4.20	0.77
16	If I had known strategies in reading, I would have been able to read texts in English better.	4.79	0.76
17	I think other teachers teaching reading should use the RTP in reading classes.	4.34	0.81
Average		4.23	0.86

Note: (1 = very low; 5 = very high)

Findings obtained from the interviews disclose the students' positive attitudes towards the RTP. As can be seen from the following verbatim quotes, the students believed that the RTP was very helpful and that they were more confident in utilizing the reading strategies to help them understand texts. Working collaboratively in groups helped them understand texts and broaden their perspectives of texts since they had plenty of opportunities to discuss and ask for clarifications from their classmates.

> "For me, I think the RTP is really useful. Yes, I have learned the four reading strategies. The four strategies help me understand the passage easily. Now I know how to predict the passage from the topic or illustrations, clarify unknown words or phrases, and summarize the sentences or paragraphs." (Student 2, Interviews, 2 April, 2018)

> "I am happy. I have an opportunity to learn how to use the four reading strategies. Using the strategies helped me get the main points of the passage easily and quickly. But I think I have to practice more." (Student 4, Interviews, 2 April, 2018)

> "The RTP is very useful. Now I can predict, clarify, make questions and summarize when I read a text. It is helpful for me to understand the text and I can remember the main ideas of the text after reading." (Student 5, Interviews, 2 April, 2018)

> "I enjoyed working with my group. Reading with friends helped me understand the passage more as we could help and share." (Student 1, Interviews, 2 April, 2018)

"We could help each other when we work in groups. I enjoyed myself and I felt relaxed. Working in groups also helped us understand the text." (Student 2, Interviews, 2 April, 2018)

Findings also illustrate how the students utilized and benefitted from the four reading strategies. First, predicting helped them funnel their thought in the right direction (Tracey & Morrow, 2012). The students made use of titles, illustrations and other clues in texts to predict what they were about before they read. They concentrated on their predictions and tried to either prove or disprove them while reading. This made them read with purposes.

"Predicting is useful. Before reading the passage, I could predict what the text would be about from the title or illustrations." (Student 6, Interviews, 2 April, 2018)

"It is challenging to analyze the title or illustrations of the text and guess what the text is about. While reading, I tried to find out if my prediction was right or wrong." (Student 8, Interviews, 2 April, 2018)

Second, clarifying was an important means of fixing reading problems. The students made use of context clues to guess or fix word meanings. When their attempts by using such clues were unsuccessful, they had to seek help from friends or the teacher in order to get clarification.

"It is important to know the meaning of words in order to help me understand the text. Sometimes, I could guess the meaning of unknown words from context clues or from my background knowledge. I don't need to clarify the meaning of every unknown word." (Student 2, Interviews, 2 April, 2018)

"The more I know the meaning of the words, the more I understand the passage. I clarify unknown words using references from the context. Sometimes, asking friends is useful." (Student 3, Interviews, 2 April, 2018)

"Clarifying helps me understand the passage. I sometimes look at a sentence structure to see the relationship of the unknown words to the sentence. I sometimes skip some unknown words." (Student 5, Interviews, 2 April, 2018)

"I learned how to use prefixes, suffixes, and parts of speech to help me clarify unknown words. The bold words or phrases in the passage are very useful." (Student 4, Interviews, 2 April, 2018)

Third, questioning became a means of helping the students identify important information in texts (Grabe, 2009; Palincsar, 2013), set their purposes for reading, and check their understanding of the information (Adunyarittigun, 1999; Palincsar & Brown, 1984).

"Asking questions before, during, and after reading helped me get the main point of the passage. It helped me check my understanding." (Student 7, Interviews, 2 April, 2018)

> "I found questioning useful. I asked myself questions to check whether I comprehended content of the passages. I examined the content of the passage carefully in order to answer the questions." (Student 4, Interviews, 2 April, 2018)

Last, summarizing was utilized to identify important information in texts. The students had to extract important ideas and delete trivial detail. Summarizing helped the students become aware of how ideas in the text are connected (Trabasso & Bouchard, 2002) and became a means of self-monitoring (Adunyarittigun, 1999; Brown & Palincsar, 1987; Grabe, 2009) and self-review (Palincsar & Brown, 1984).

> "Summarizing after reading each paragraph helps me comprehend the paragraph better. I always stop after reading each paragraph and talking to myself about what I have learned from the paragraph." (Student 5, Interviews, 2 April, 2018)

> "I have found that I understand what I have read more by summarizing, especially, the main points of each paragraph and the whole passage." (Student 8, Interviews, 2 April, 2018)

It was common that the students felt uncomfortable learning how to use the RTP since they were unfamiliar with this instructional approach. After they utilized the RTP and found that it was beneficial to them, they had positive attitudes towards the approach and also suggested that the RTP should be taught to high school students as early as possible.

"The strategies were something I had never heard of before and were hard to understand. At the end of the demonstrations, I started to understand and I think they are very useful. I wish I had learned them when I first started high school as they would have helped me a lot." (Student 8, Interviews, 2 April, 2018)

"The only problem I had was learning the strategies and then using them. I wanted to go back to my old ways. At the end I got used to them and I am very happy I have learned them." (Student 9, Interviews, 2 April, 2018)

Findings show that the students had positive attitudes towards the RTP and also believed the RTP was beneficial to them. They learned how to predict, activate prior knowledge, ask questions, check and monitor their reading, utilize clarifying as a fix-up strategy to solve problems and summarize what they read. The use of the strategies took place within the social context of the classroom where interactions occurred between teacher and students, and students and students. More capable students provided less capable students with guidance and support to help them use the strategies effectively and gradually transferred their responsibility to those less capable (Adunyarittigun, 1999; Pearson & Gallagher, 1983). Those less capable eventually became responsible for their own reading and became self-regulated readers. In small groups, students had opportunities to share their ideas with other students, vicariously learn how to utilize the strategies and develop their comprehension (Grabe, 2009; Soranastastaporn & Ratanakul, 2000; Tinungki, 2015). This helped motivate less capable students to apply the strategies confidently and experience reading success (Palincsar, 2013; Snow, 2002).

Implications for Practice

The results of this study suggest pedagogical implications for teaching Thai high school students. Firstly, it is important for teachers to understand both the RTP theoretical framework and its practical application before the implementation of the RTP in the classroom. Intensive workshops on the RTP, including discussion of its theoretical framework and procedures of the RTP, are needed for teachers to enable them to understand and implement the RTP appropriately and effectively.

Secondly, to enable students to use the four strategies (predicting, questioning, clarifying and summarizing) in the RTP effectively, EFL students should receive instruction on what, when, why, and how to use the RTP (Adunyarittigun, 1999; Adunyarittigun & Pidchamook, 2013). Teachers should provide students with explicit instruction of the four strategies (Hansan, 1994; Song, 1998), modeling and demonstration of how to utilize the RTP. Students need to understand the importance of the RTP and its procedure. At the outset, they may feel uncomfortable with the RTP, so they should be given adequate time for practicing each of the four strategies, applying the RTP, working in groups, and taking a role of discussion leader. Teachers should provide students with scaffolding at the beginning and minimize their role and support gradually (Pearson & Gallagher, 1983). When the students take full responsibility undertaking the RTP, support should be provided as necessary.

Recommendations for Further Studies

It would be interesting to perform further studies of the RTP in relation to other aspects. The following are recommendations for further studies.

Further studies should be conducted in order to investigate the effects of the RTP with EFL young learners, especially at the elementary

and secondary school levels. Takala (2006) suggested that the earlier the RTP strategies are applied, the higher the probability that students will improve their reading ability is.

It is interesting to investigate the effects of the RTP on reading performance of Thai high school students who have low English proficiency when L1 is used to facilitate their learning. It is very likely that the use of L1 during implementing the RTP for those students with low English proficiency will facilitate their interaction, discussion and learning, leading to an improvement of their reading performance.

Limitations

Generalizability of the results from this study must be confined to situations where the students, teacher, testing and time constraints are comparable. The diversity of English abilities in this class could affect the effectiveness of the RTP on the students' reading performance. Some of the students in this study had difficulties following the instructions, interacting in English with the teacher as well as their classmates. As a consequence, it took a large amount of time for the students with low English proficiency to complete assignments in groups, interact with the teacher and their classmates, and lead group discussions.

The implementation of the RTP in this study was conducted in English by a native English-speaking teacher. Some students might have had difficulties following the instructions and having interactions with the teacher due to their language barrier. It was observed that some students understood the teacher but were unable to respond in English.

Conclusion

The results of this study revealed that the RTP had a positive effect on Thai high school students' reading performance and that the students had positive attitudes towards it. The RTP helped promote students' cognitive skills and improve their reading ability (Hansan, 1994; Okkinga et al., 2018; Palincsar, 2013; Song, 1998; Soonthornmanee, 2002; Supasorn, 2013; Wisaijorn, 2003; Yang, 2010; Zhang, 2008). The RTP incorporates comprehension-fostering and comprehension-monitoring activities, encourages both capable and less capable students to read, discuss texts and work collaboratively in interactive group settings.

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References

Adunyarittagun, D. (1998). *The effects of the reciprocal teaching procedure on Thai EFL students' reading performance and self-perception as readers* (Doctoral dissertation). Available from ProQuest Dissertation and Theses database. (UMI No. 9836359)

Adunyarittigun, D. (1999). Reciprocal teaching: A new chapter for EFL reading instruction. *Thoughts,1999*(1) ,142-150.

Adunyarittigun, D., & Pidchamook, W. (2013). Harnessing the power of K-W-L to help struggling EFL readers become strategic readers. *PASAA*, 45, 11-33.

Ahmadi, M. R., Ismail, H. N., & Abdullah, M. K. K. (2013). Goals of reciprocal teaching strategy instruction. *The International Journal of Language Learning and Applied Linguistics World, 2*(1), 18-27.

Brown, A. L., & Palinscar, A. S. (1987). Reciprocal teaching of comprehension strategies: A natural history of one program for enhancing learning. In J. D. Day & J. G. Borkowski (Eds.), *Intelligence and exceptionality: New directions for theory, assessment, and instructional practices* (pp. 81-132). Norwood, NJ: Ablex Publishing.

Bruce, M. E., & Robinson, G. L. (2004). Clever kids: a metacognitive and reciprocal teaching program to improve both word identification and comprehension for upper primary readers experiencing difficulty. *Australian Journal of Learning Disabilities, 9*(3), 19-33.

Doolittle, P. E., Hicks, D., Triplett, C. F., Nichols, W. D., & Young, C. A. (2006). Reciprocal teaching for reading comprehension in higher education: A strategy for fostering the deeper understanding of texts. *International Journal of Teaching and Learning in Higher Education, 17*(2), 106-118.

Duffy, G. (2002). *The case for direct explanation of strategies.* New York, NY: Guilford Press.

Freihat, S., & Al-Makhzoomi, K. (2012). The effect of the reciprocal teaching procedure (RTP) on enhancing EFL students' reading comprehension behavior in a university setting. *International Journal of Humanities and Social Science, 2*(5), 279-291.

Grabe, W. (2009). *Reading in a second language: Moving from theory to practice.* New York, NY: Cambridge University Press.

Graves, M. F., & Graves, B. B. (2003). *Scaffolding reading experiences: Designs for students' success.* Norwood, MA: Christopher–Gordon.

Hasan, B. (1994). *The effects of the reciprocal teaching of comprehension strategies on the abilities of EFL students at Kuwait University* (Unpublished doctoral dissertation). University of Colorado, Denver, CO.

Hou, Y. J. (2015). Reciprocal teaching, metacognitive awareness, and academic performance in Taiwanese junior college students. *International Journal of Teaching and Education, 3*(4), 15-32.

Jones, J. (1999). From silence to talk: Cross cultural ideas on students' participation in academic group discussion. *English for Specific Purposes, 18*(3), 243-259.

Lantolf, J. P., & Appel, G. (1994). *Vygostkian approaches to second language research.* Norwood, NJ: Ablex.

Lederer, J. (2000). Reciprocal teaching of social studies in inclusive elementary classrooms. *Journal of Learning Disabilities, 33*(1), 99-107.

Liu, A., & Bu, Y. (2016). Reciprocal learning strategy in CALL environment: A case study of EFL teaching at a university in Shanghai. *Universal Journal of Educational Research, 4*(5), 1059-1070.

Lysynchuck, L. M., Pressley, M., & Vye, N. J. (1990). Reciprocal teaching improves standardized reading comprehension performance in poor comprehenders. *The Elementary School Journal, 90*(5), 469-484.

Malock, B. (2002). Scaffolding student talk: One teacher's role in literature discussion groups. *Reading Research Quarterly, 37*(1), 94-112.

Milada, B. (2019). *New weaving it together: Connecting reading and writing.* Bangkok, Thailand: Thai Watana Panich.

Oczkus, L. D. (2018). *Reciprocal teaching at work: Powerful strategies and lessons for improving reading comprehension* (3rd ed.). Alexandria, VA: ASCD.

Okkinga, M., Steensel, R., Gelderen, A. J., & Sleegers, P. J. (2018). Effects of reciprocal teaching on reading comprehension of low-achieving adolescents. The importance of specific teacher skills. *Journal of Research in Reading, 41*(1), 20-41.

Palincsar, A. S. (2013). Reciprocal teaching. In J. Hattie & E. M. Anderma (Eds.), *International guide to student achievement* (pp. 369-371). New York, NY: Routledge.

Palincsar, A., & Brown, A. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 2,* 117-175.

Pearson, P. D., & Gallagher, M. C. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology, 8*(3), 317-344.

Pearson, P. D., & Johnson, D. D. (1978). *Teaching reading comprehension.* New York, NY: Holt, Rinehart & Winston.

Peregoy, S. F., & Boyle, O. F. (2016). *Reading, writing, and learning in ESL: A resource book for K-12 teachers* (7th ed.). Boston, MA: Pearson Education.

Pressley, M. (2002). *Metacognition and self-regulated comprehension.* Newark, DE: International Reading Association.

Ratanakul, S. (1997). *An experimental study of the use of the reciprocal teaching technique in teaching English reading comprehension* (Unpublished doctoral dissertation), Mahidol University, Nakhon Pathom, Thailand.

Rogoff, B., & Gardner, W. P. (1984). Adult guidance of cognitive development. In B. Rogoff & J. Lave (Eds.), *Everyday cognition: Its development in social context* (pp. 95-116). Cambridge, MA: Harvard University Press.

Saiyasombut, S. (2012). *Thai education failure: PISA score & a challenge for the 21st century.* Bangkok, Thailand: Bangkok Post.

Slater, W. H., & Horstman, F. R. (2002). Teaching reading and writing to struggling middle school and high school students: The case for reciprocal teaching. *Preventing School Failure, 46*(4), 163.

Snow, C. E. (2002). *Reading for understanding: Toward an R&D program in reading comprehension.* Santa Monica, CA: RAND.

Song, M. J. (1998). Teaching reading strategies in an ongoing EFL university reading classroom. *Asia Journal of English Language Teaching, 8*, 41-54.

Soonthornmanee, R. (2002). The effect of the reciprocal teaching approach on the reading comprehension of EFL students. *RELC Journal, 33*(2), 125-140.

Soranastastaporn, S., & Ratanakul, S. (2000). An experimental study of the use of grammar translation and the reciprocal teaching technique in teaching English reading comprehension. *SLLA Studies in Language and Language teaching, 9*, 1-17.

Supasorn, N. (2013). *The effects of reciprocal teaching with video clips on reading strategy enhancement* (Unpublished master's thesis). Khon Kaen University, Khon Kaen, Thailand.

Takala, M. (2006). The effects of using reciprocal teaching on reading comprehension in mainstream and special (SLI) education. *Scandinavian Journal of Education Research, 50*(5), 559-576.

Taylor, B. M., Frye, B. J., Short, R. A., & Shearer, B. (1992). Classroom teachers prevent reading failure among low-achieving first-grade students. *The Reading Teacher, 45*(8), 592-597.

Tinungki, G. M. (2015). The role of cooperative learning type team assisted individualization to improve the students' mathematics communication ability in the subject of probability theory. *Journal of Education and Practice, 6*(32), 27-31.

Trabasso, T., & Bouchard, E. (2002). Teaching readers how to comprehend text strategically. In C. C. Block & M. Pressley (Eds.), *Comprehension instruction: Research-based best*

practices (pp. 176-200). New York, NY: The Guilford Press.

Tracy, D. H., & Morrow, L. M. (2012). *Lenses on reading: An introduction to theories and models* (2nd ed.). New York, NY: The Guilford Press.

Vygotsky, L. S. (1978). *Mind in society: The development of the higher psychological processes*. Cambridge, MA: Harvard University Press.

Weedman, D. L. (2003). *Reciprocal teaching effects upon reading comprehension levels on students in 9th grade* (Unpublished doctoral dissertation). Spalding University, Louisville, KY.

Wertsch, J. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

Wisaijorn, P. (2003). *Teaching reading comprehension to Thai EFL students: Reciprocal teaching procedure* (Unpublished doctoral dissertation). University of Canberra, Canberra, Australia.

Wood, D. J., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*(2), 89-100.

Yang, Y. F. (2010). Developing a reciprocal teaching/learning system for college remedial reading instruction. *Computer & Education, 55*(3), 1196-1201.

Yoosabai, Y. (2009). *The effects of reciprocal teaching on English reading comprehension in a Thai high-school classroom* (Unpublished doctoral dissertation). Srinakharinwirot University, Bangkok, Thailand.

Zhang, L. J. (2008). Constructivist pedagogy in strategic reading instruction: Exploring pathways to learner development in the English as a second language (ESL) classrooms. *Instructional Science: An International Journal of the Learning Sciences, 36*, 89-116.