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Effectiveness of the QARR Strategy to Enhance Thai EFL Students' Performance in Reading Comprehension Test

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ABSTRACT

The Question-Answer-Relationship (QAR) strategy has been suggested to improve EFL students' reading comprehension. Nonetheless, disappointing outcomes when using the QAR instruction were noted. The current study seeks to 1) add the Review (R) component to the instruction and 2) assess the effectiveness of the developed Question-Answer-Response-Review (QARR) instruction to improve reading comprehension among Thai EFL university students. Instructional concepts such as common question types (Yathip & Chanyoo, 2022), the Question-Answer-Relationship strategy (Raphael & Au, 2005), the experiential learning approach (Kolb, 2014), and the reading instruction principle (Raphael, Highfield, & Au, 2006) were synthesized to create the instruction. The developed curriculum was implemented with 58 Thai EFL students. Data were examined using frequency, mean, standard deviation, and F-test. As for the findings, the experts' high degree of agreement (M = 0.96) demonstrated the

efficiency of the developed instruction. One-way repeated measures revealed that the posttest (M = 21.74, SD = 4.12, d = 0.89) and delayed posttest (M = 22.19, SD = 4.23, d = 0.95) were substantially higher than the pretest mean scores (M = 16.86, SD = 5.59, p <.001) with a large effect size (η^2= 0.209). Participants' satisfaction surveys strongly agreed with the created instruction (M = 4.36, SD = 0.63), consistent with interview data.

Keywords: QARR strategy, R-review (experiential learning), questions in reading comprehension test, EFL university students

Introduction

Reading comprehension is viewed as "the most fundamental purpose of reading, underpinning and sustaining the majority of other reasons for reading" (Grabe & Stroller, 2011, p. 8). Prior research has also established that reading proficiency corresponds with reading comprehension, which connects with academic accomplishment (Dogan et al., 2015; Nyarko et al., 2018).

Reading English textbooks has become one of the most difficult tasks for Thai students (Lornark & Muangsamai, 2010; Wutthisingchai, 2011). Studies have demonstrated that Thai university students struggle with reading comprehension in various tasks, such as identifying topics and important ideas in passage reading. Considering this a key reading difficulty, Thailand still requires reading comprehension education to improve effective reading skills.

Although reading comprehension entails a wide variety of cognitive and metacognitive strategies, a student's ability to 'read' is often assessed in standardized tests using multiple choice questions. To assist test takers with a strategy for selecting the correct response to text-based questions, Raphael and colleagues (2006) introduced a strategy for the readers to use questions in the test to guide them in finding the answers, later termed the Question-Answer-Relationship (QAR). This strategy encourages students to analyze the reading task by identifying a question type and reading process that corresponds to the question to respond accurately to the question. The knowledge of question types based on the QAR strategy has been proven effective in enhancing reading comprehension on tests among students (see Aziz & Yasin, 2017; Kinniburgh & Prew, 2010; Peng et al., 2007).

Previous studies showed, however, contrary results after students learned and practiced the QAR strategy. For example, Stafford (2012) found

that students could identify question categories but could not respond to the reading comprehension questions on the test. This failure indicates that the target students could not complete the reading comprehension exercises even though they could classify question categories. In other words, students could perform only one side of the operation– identify the question type. Based on this finding, the researchers argued that the current QAR strategy needed a stage where students could review their tentative answers to the multiple-choice item on the test or in the reading exercise. Thus, the present study proposes an additional "Review" stage to enhance effectiveness in tackling reading comprehension tests. Based on this rationale, the main objective of the study can be broken into two sub-objectives: 1) to propose the addition of the Review (R) component in the instructional design, and 2) to evaluate the effectiveness of the revised Question-Answer-Response-Review (QARR) instruction for enhancing reading comprehension among Thai EFL university students. In line with the research objectives, the current study addresses three research questions:

1) Is the instructional design effective as assessed by the experts?
2) Does the QARR instruction enhance university students' English reading comprehension scores on standardized tests?
3) What is the satisfaction level of the students who have learned and used the QARR approach?

Literature Review

Concepts of the QAR Strategy

According to Raphael et al. (2006), the QAR strategy can be divided into three teaching stages: Firstly, the Q-component requires students to identify question components (i.e., key ideas and hints) to use as a source for determining a question type and recognizing information for processing the answer to a question. Then the A-component requires students to identify the question type (i.e., literal comprehension, reinterpretation, and inference) based on the question components of the strategy. The R-component requires readers to select a reading process related to the question type identified in phase A. Then the students find the answer for a particular type of question based on their knowledge of the reading process (pp. 118-122).

Addition of R (Review) Component in the QAR Strategy

Regarding the concerns on the importance of reviewing process and reflective notions, the study aimed to propose the inclusion of the R-review stage, thus transforming the acronym QAR to QARR. The R-review stage

consisted of three cognitive tasks described below in Table 1: (Kolb & Kolb, 2009; Kolb, 2014).

Table 1

Three Cognitive Tasks of the R-Review Stage

Cognitive Task	Description
1. *Self-Monitor* (Recalling experience)	Students describe their reading task by observing the question components, a question type, and how they find the answer to this question.
2. *Self-Reflection* (Reflecting & Thinking)	Students reflect on the question type and reading process knowledge used for an answer to justify the relevance between question type and response, whether the task is completed, or whether students need to revise the task (i.e., irrelevance between the answer and reading process - question type).
3. *Self-Revision* (Acting)	Considering the irrelevance between the answer and reading process - question type, students analyze the question again based on new knowledge from the reflection stage to revise the task for better potential performance.

Principles of the Instructional Model

The pedagogical implementation of the QARR approach can be described in three phases, which include the original proposal and the inclusion of the final R– the review stage that requires readers to double check the accuracy of their answer to the multiple-choice test question (Kolb, 2014; Raphael et al., 2006). 1) In the first phase, explanation and modeling, the teacher demonstrates how to use the QARR strategy in processing answers to questions posed in the reading task. 2) The guided practice encourages students to try out the QARR strategy in processing the answer to the reading questions with the teacher's guidance. 3) Independent practice refers to the step in which students apply what they have learned to do the task by themselves without the intervention of a teacher.

Relevant Studies: Implementations of QAR in the Thai Contexts and Justification for the Review Stage

Prior research looked into the impact of the QAR strategy on Thai EFL learners' reading ability on tests in Thailand. Rothong (2013), for example, studied the influence of QAR instruction on eleventh-grade students and discovered that the mean score of the reading comprehension posttest was much higher than the mean score of the pretest. Furthermore,

the students were enthusiastic about English reading and eager to answer reading questions. In previous studies in the L2 environment, QAR was often implemented with young learners. However, evidence of implementation in higher education or with adult learners has yet to be revealed. As a result, this study is a new emphasis for university participants struggling with reading and are obliged to take many reading assessments. The implementation with this group will show clearly that they can complete reading tests or tasks using the core QAR and the added R-review.

Methodology

Development of Instruction

The Procedure of Instructional Development

The instructional procedure's development was divided into four steps.

1. The researchers reviewed the cause of reading difficulties in Thai EFL university students. The reviews indicated the low reading scores were from reading comprehension exams, as previous studies have claimed (Chawwang, 2008; Hayikaleng et al., 2016; Puangmaliwan, 2005).

2. Second, a synthesis of related instructional concepts and theories revealed that the Question-Answer-Relationship (QAR) strategy developed by Raphael et al. (2006) and the R-review derived from Kolb's (2014) experiential learning were promising for improving Thai students' reading comprehension test scores, as evidenced by previous studies (e.g., Aziz & Yasin, 2017; Kinniburgh & Prew, 2010; Peng et al., 2007).

3. Third, the synthesis suggested four learning principles for reading instruction, including explanation, modeling, guided practice, and independent practice (Kolb, 2014; Raphael et al., 2006). (See Table 2).

4. The researchers identified the components of instruction, which included (1) QARR instruction principles, (2) pedagogical guidelines for instructional implementation, and (3) an outline of lesson plans.

Pedagogical Guidelines for the Instructional Implementation

The researchers designed learning activities based on Question-Answer Relationship (QAR) and R-Review to facilitate students in achieving the instruction objectives. The instructional model contains five learning steps, including (1) explanation, (2) modeling, (3) guided practice, (4) independent practice, and (5) closure and lesson assessment. The procedures

in learning management of this instruction are presented in the following table:

Table 2

Procedures in Learning Management of the QARR Instruction

Learning Step	Description	Teacher's Role	Student's Role
1. Explanation	The main purpose is to explain concepts of the QARR strategy to students.	*Resource:* A teacher presents the QARR strategy concept.	Students learn the concepts of QARR and question types.
2. Modeling	The second phase aims to demonstrate the steps in using the QARR strategy to complete the reading tasks.	*Role model & Resource:* A teacher demonstrates how to use the QARR strategy to process an answer for a question and how to review the reading task.	Students observe how to use the QARR strategy from the teacher's demonstration.
3. Guided practice	Students practice using the QARR strategy in doing the reading comprehension tasks.	*Support:* A teacher gives students a handout of the QARR analysis manual and practice exercise. A teacher also acts as a facilitator to guide students using the strategy.	With the teacher's guidance, students complete the provided reading tasks based on the QARR strategy.
4. Independent practice	Students complete the reading task individually without help from the teacher.	*Observe & Support:* A teacher assigns students to do the reading task independently with less teacher guidance.	Students independently practice the QARR strategy on the reading task based on their understanding.
5. Closure & Lesson Assessment	Closure & lesson assessment aims to summarize the lesson that students have learned. Moreover, students are asked to take in the evaluation for a particular lesson.	*Evaluate:* A teacher asks students to summarize and assess the lesson to evaluate their understanding and achievement.	Students review and summarize what they have learned in the lesson and complete the assessment.

Outline of the Lesson Plans

The researchers implemented four lessons based on the QARR approach. The lesson topics were developed based on Yathip and Chanyoo's (2022) investigation of common question types in reading comprehension tests. In each lesson, the students spent 90 minutes participating in the instructional activities based on five learning steps: *explanation*, *modeling*, *guided practice*, *independent practice*, and *closure and assessment*. The topics of four lesson plans and three pre-, post-, delayed-post test sessions are presented in the table below.

Table 3

Teaching Schedule of the QARR Instruction

Week 1	**Pretest & Introduction to QARR Concepts and Procedures**
Week 2	Literal Comprehension and Reinterpretation Questions
Week 3	Inference Questions
Week 4	All Three Types of Questions & Posttests
Week 7	Delayed Posttest

Implementation and Validation of the Instruction

Population and Sample

The population is 300 students in the Faculty of Science at Z University. Originally 170 students were determined to recruit, as Krejcie & Morgan (1970) suggested. Nevertheless, the COVID-19 pandemic prevented the researchers from reaching the ideal number of participants, thus resulting in 58 students being included in the study. The online learning mode also made it difficult for the researchers to recruit a control group because it was impossible to assert the homogeneity of the participants, resulting in employing only one group of participants. Having only a single experimental group, the researchers added a delayed posttest to assure validity and students' retention of the intervention.

Research Design

One group pretest-posttest-delayed-posttest design was adopted to investigate the effectiveness of implementing the QARR approach for enhancing reading comprehension among Thai EFL students.

Research Instrument

The research instruments for the implementation were as follows:

The QARR approach includes learning handouts, a pretest, a posttest, and a delayed posttest. The learning materials in each session deliver the content, including QARR strategy elements, 25 multiple-choice questions, and three reading practices. Furthermore, the pretest, posttest, and delayed posttest (i.e., an alternate form of the posttest) were utilized to evaluate participants' reading comprehension scores. The test included three reading passages and 30 multiple-choice question items.

Second, a satisfaction questionnaire, adapted from Wattanasuk (2016), was used to assess students' satisfaction toward the QARR approach. The questionnaire was divided into three sections, including the teaching process (items 1-4), contents and teaching materials (items 5-7), and advantages and applications (items 8-10). A Likert scale of 1 to 5 was used for the participants to identify their levels of agreement. According to Sunsom (2001), an average score of 4.51 - 5.00 indicates strong agreement; an average score of 3.51 - 4.50 indicates agreement; an average score of 2.51 - 3.50 indicates neutrality; an average score of 1.51 - 2.50 indicates disagreement; and an average score of 1.00 - 1.50 indicates strong disagreement (p.76).

Implementation of the Instructional Procedures

The researchers classified the processes for implementing the QARR approach into four phases.

1. First, the researchers requested permission to recruit the student participants in a letter to relevant officials at Z University.

2. The researchers next conducted the pretest to determine the participants' reading comprehension scores (50 minutes).

3. The researchers carried out three lessons' instructional processes, devoting 90 minutes to each session, separated into five phases.

3.1 The teacher used activities such as questioning and discussing themes linked to the learners' prior knowledge (10 minutes).

3.2 The participants learned to use the QARR strategy and typical question kinds (15 minutes).

3.3 The participants practiced assessing the question type with the teacher's assistance. (75 minutes).

3.4 The participants independently performed a question-type analysis in reading activities (15 minutes).

3.5 The participants completed the assignment following the class to assess their learning progress (15 minutes).

4. In the final lesson, the researchers gave the participants a posttest and a delayed posttest (conducted three weeks after the posttest) to measure their reading comprehension scores. At the end of the experiment, a satisfaction survey was administered.

Results

The results of the effectiveness of the approach were reported in line with the research questions: 1) effectiveness of the instructional design from experts' judgment, 2) students' reading comprehension scores from the pretest, the posttest, the delayed-posttest, and 3) students' satisfaction toward implementation of the QARR approach.

Findings One: The Effectiveness of the QARR Instructional Design from the Experts' Point of View

Rothong's checklists (2013) for the experts were adopted. The instructive, evaluative item that received 0.5 was deemed appropriate, whereas the item that received 0.5 was altered following the experts' recommendations. The validation results revealed that the congruence items in the four evaluation forms (i.e., lesson plans 1-4) obtained scores ranging from 0.67 to 1.00 (M = 0.96). The findings suggested that lesson plans 1 (M = 0.93), 2 (M = 1.00), 3 (M = 1.00), and 4 (M = 1.00) were appropriate and acceptable for implementation with the participants.

Finding Two: Reading Comprehension Scores from Pretest, Posttest, and Delayed-Posttest

Finding two reflects the reading comprehension scores from the pretest, posttest, and delayed-posttest. The posttest was administered four weeks after the pretest, and the delayed-protest was administered three weeks after.

Table 4

Reading comprehension scores from the pretest, the posttest, and the delayed posttest

Test	*n*	Possible Score	Max	Min	$\bar{X}$	*SD*

Pretest	58	30	28	5	16.86	5.59
Posttest	58	30	28	13	21.74	4.12
Delayed Posttest	58	30	29	14	22.19	4.23

Table 4 shows the participants' lower mean scores in the pretest (M = 16.86, SD = 5.59) than in the posttest (M = 21.74, SD = 4.12) and the delayed-posttest (M = 22.19, SD = 4.23).

A one-way repeated measures ANOVA was used to examine the differences in the reading comprehension scores among pretest, posttest, and delayed-posttest. Mauchly's test of sphericity was used in the initial investigation into the differences among three scores (Mauchly's W = 0.62, x^2= 26.55, df = 2, p < .001), indicating that these three mean scores are not compound symmetry. The analysis of Greenhouse-Geisser showed the differences among pretest, posttest, and delayed-posttest scores (F *(1.45, 82.76)* = 39.74, p < .001) with a large effect size as reported by the omega squared (ω^2 = 0.199) and the eta squared (η^2 = 0.209) (Cohen, 1988). Table 5 shows pairwise comparisons of the reading comprehension scores from the pretest, the posttest, and the delayed posttest.

Table 5

Comparisons among the Reading Comprehension Scores

Time (I)	Time (J)	MD (I-J)	Std. Error	*p*
Pretest	Posttest	-4.85***	0.74	0.00
	Delayed Posttest	-5.29***	0.77	0.00
Posttest	Pretest	4.85***	0.74	0.00
	Delayed Posttest	-0.45	0.41	0.84
Delayed Posttest	Pretest	5.29***	0.77	0.00
	Posttest	0.45	0.41	0.84

***p < .001

The results from a repeated measures analysis of variance indicated that the reading comprehension scores (i.e., pretest, posttest, and delayed-posttest) differed. Pairwise comparisons were then employed, showing that the posttest (M = 21.74, SD = 4.12) and delayed-posttest (M = 22.19, SD = 4.23) were significantly higher than the pretest mean scores (M = 16.86, SD = 5.59, p < .001). Furthermore, the analysis also showed a large effect size between the posttest and pretest (d = 0.89) and the delayed-posttest and

pretest (d = 0.95). Nevertheless, the posttest mean score is lower than the delayed-posttest without a significant value (p = 0.84).

Findings Three: Participants' Satisfaction with the QARR Approach

In the last teaching lesson, the participants were asked to complete a questionnaire to evaluate their satisfaction with the developed QARR approach. The following table presents the participants' satisfaction with the QARR instruction.

Table 6

Participants' Satisfaction with the QARR Instruction from the Questionnaire

No.	Satisfaction Item	$\bar{X}$	*SD*	Interpretation	Rank
Teaching Process					
1	Teaching activities promoted students' thinking and learning skills to process their knowledge.	4.40	0.56	agree	2
2	The instructor organized the teaching process systematically so students understood and acquired the QARR strategy for improving reading comprehension.	4.53	0.60	strongly agree	1
3	Students were promoted to participate in summarizing the lessons, and students can ask questions when they have inquiries.	4.31	0.73	agree	3
4	Students received enough appropriate exercises for self-practicing and improving reading comprehension.	4.26	0.58	agree	4
Total mean score: Teaching process		4.38	0.63	agree	1
Contents and Teaching Materials					
5	The number of contents and difficulty of teaching activity were appropriate for students.	4.34	0.61	agree	1
6	The contents of the lessons were interesting.	4.31	0.68	agree	2
7	Handouts and teaching materials promoted the learning process.	4.29	0.72	agree	3
Total mean score: Contents and Teaching Materials		4.32	0.67	agree	3
Benefits and Applications					
8	The QARR approach improves students' reading comprehension.	4.26	0.61	agree	3
9	The QARR approach improves students' thinking and analytical skills.	4.43	0.60	agree	2
10	Students can apply the QARR strategy in another context.	4.45	0.60	agree	1
Total mean score: Benefits and Applications		4.38	0.60	agree	1

Overall	4.36	0.63	agree

Table 6 shows that the participants agreed (Max = 5; Min = 1) on the satisfaction items about the QARR instruction (M = 4.36, SD = 0.63). The following sections show participants' scores from the three categories: instructional process, teaching materials' contents, and instruction benefits.

Teaching Process

Items 1 - 4 in the questionnaire asked participants about their satisfaction with the teaching process (M = 4.38, SD = 0.63). The highest score in this category was item 2 (M = 4.53, SD = 0.60). Item 4 was the lowest mean score in the questionnaire (M = 4.26, SD = 0.58).

Contents in the Teaching Materials

Items 5 - 7 in the questionnaire received a high degree of agreement in their satisfaction with the contents of teaching materials (M = 4.32, SD = 0.67). Item 5 scored highest in the category (M = 4.34, SD = 0.61). The lowest was item 7 (M = 4.29, SD = 0.72).

Benefits from the QARR Instruction

Items 8 - 10 in the questionnaire received a high degree of agreement about satisfaction regarding benefits from the QARR instruction (M = 4.38, SD = 0.60). Item 10 (M = 4.45, SD = 0.60) was the highest score in the category. The lowest score was item 8 (M = 4.26, SD = 0.61).

Supplementary Findings: Participants' Task Observation, Satisfaction, and Comments from Interview

In addition, researchers aimed to investigate the additional findings extracted from a task observation and interview to affirm and triangulate the students' satisfaction with the QARR instruction implementation.

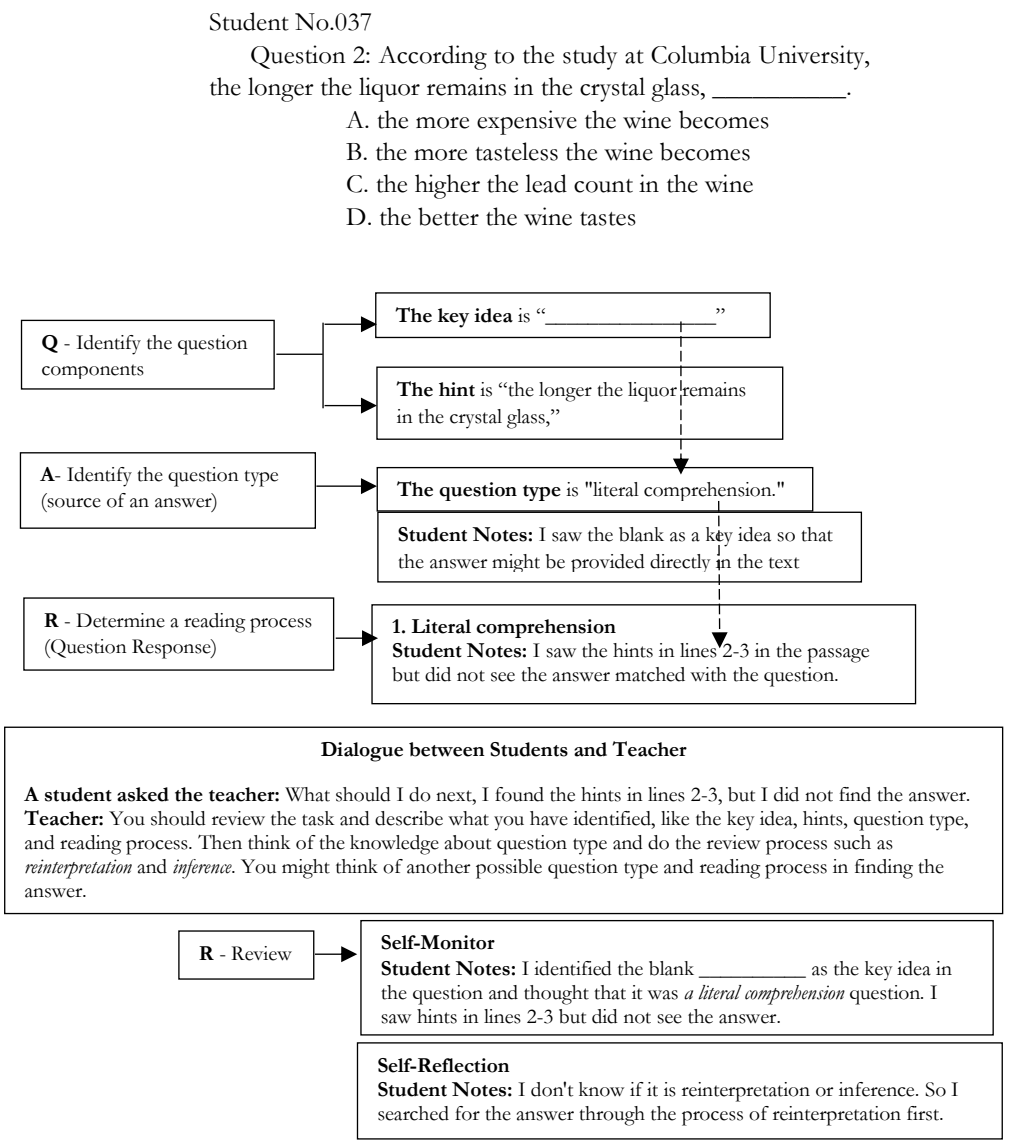
Participants' Learning Observations

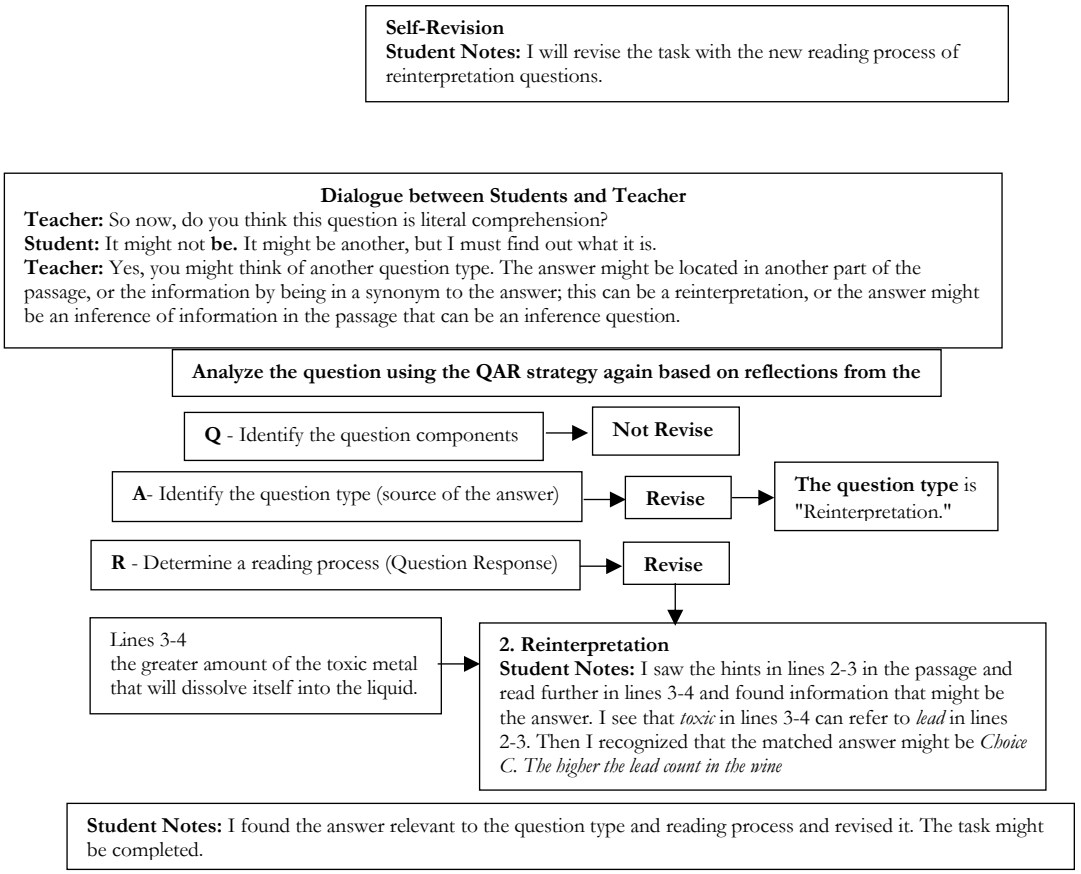
Students' learning observations were analyzed from the assignment they completed while learning the QARR approach. The observation discovered that the students' process in investigating the answer to a question

was twofold: 1) the analysis of the question and the reading process used to investigate the answer, and 2) the review process used for reflecting on the knowledge and evaluating the task. The observations show a sample of students' tasks that used the QARR approach to complete the task.

Figure 1

Student's Observation of Using the Q-A-R-R Process





Participants' Satisfaction and Comments from the Interview

Six participants who gained at least ten more points in the posttest were invited to the interview session. The interview sessions were conducted to elicit their satisfaction details. The interview data were classified into four categories by the researchers and the inter-rater with an absolute agreement, using a guideline of classification schemes, as presented in the table below.

Table 7

Guideline of Classification Schemes toward Complementary Comments and Satisfactions

Category	Keyword	Example
1. Teaching Process	Teaching activities promoted	Teaching activities promoted students' thinking and learning skills to process their knowledge.

	Instructor, teaching process	The instructor organized the teaching process systematically.
	promoted to participate	Students were promoted to participate in summarizing the lessons.
	Students received enough appropriate exercises	Students received enough appropriate exercises for self-practice.
2. Contents and Teaching materials	contents and difficulty	The number of contents and difficulty of teaching activity were appropriate for students.
	Contents in the lessons	The contents of the lessons were interesting.
	Handout and teaching materials	Handouts and teaching materials promoted the learning process.
3. Benefits and Applications	improve students'	The instructional package improves students' reading comprehension.
	improve	The instructional package improves students' thinking and analytical skills.
	Student can apply	Students can apply the QARR strategy in another context.

The interview revealed the supportive findings about students' satisfaction and comments toward the instruction in the following table.

Table 8

Participants' Satisfaction and Comment toward the QARR Instruction during the Interview

Item	Frequency (45)*	%
Teaching process	9	20 %
The online lessons took much work for me to ask the teacher for more explanations and feedback.	3	6.67%
The teacher should provide more activities in the classroom.	2	4.44%
I need more practice exercises and examples of question types.	2	4.44%
Teachers should offer more practice exercises.	1	2.22%
The teaching process and strategy were appropriate for improving reading comprehension.	1	2.22%
Contents and teaching materials	5	11.11%
I had difficulty differentiating between inference and reinterpretation questions while doing practice exercises.	1	2.22%
I find it difficult to process the answers to inference questions because the answers are not directly provided.	1	2.22%

The contents of the lessons were comprehensible and well described so that I could understand the concepts.	2	4.44%
The reading topics were interesting such as 'Cacao' and 'Caffeine.'	1	2.22%
Benefits and Applications	17	37.78%
I can use the QARR strategy to read other reading passages.	1	2.22%
The QARR strategy improved my reading skills, such as processing the passage's main idea.	1	2.22%
I confidently processed the answer to a particular type of question.	3	6.67%
I can read the passage faster with comprehension in the reading passage.	1	2.22%
The strategy eases the process of answering questions. So, I can take more time to do difficult questions (i.e., inference questions)	1	2.22%
I used the QARR strategy and spent less time answering the question, so I could review the answer and question analysis to recheck the accuracy and spend longer processing answers for difficult questions during the tests (i.e., *inference question*s).	6	13.33%
I used the review process to recheck the answers in the reading test, so I had more confidence in answering questions in posttest and delayed posttest.	4	8.89%
Others (Learners' Prior Background in Pretest)	14	31.11%
I did not use any strategy in doing the pretest.	2	4.44%
I was not interested in the passage's topic, such as 'Luddites'.	4	8.89%
I could not find the passage's key information, so I randomly selected the answer from the choices.	1	2.22%
I needed to figure out what to do for the test and needed help managing my time well. I spent much time in making understanding the ideas of each paragraph.	6	13.33%
I learned the meanings of the vocabulary in the passage.	1	2.22%
Total	45	100%

*Note: Multiple comments for each question were allowed.

A total number of 45 comments on participants' satisfaction were classified into four categories: teaching process (20%), contents and teaching materials (11.11%), benefits and applications (37.78%), and learners' prior background in the pretest (31.11%). The general comments revealed that the participants appreciated the benefits of the QARR instruction in promoting their performance in processing answers to reading questions. Moreover, they also perceived that the Review component could effectively promote their self-monitoring skills in evaluating the answer, as shown in benefits and applications (37.78%). Following the second most found comments (learners' prior background in the pretest, 31.11%), the students reported reading difficulties and negative attitudes while doing the pretest. Nevertheless, the

participants expressed concerns and commented on the teaching process (20%) and contents and teaching materials (11.11%), mentioning difficulties in processing answers for a particular question type (i.e., inference question) and difficulty in asking for feedback and participating in learning activities via the online classroom.

Discussion

Based on the results, the discussion was divided into three main sections: 1) the effectiveness of the developed instructional design from an expert's perspective, 2) a comparison of the reading comprehension scores from the pretest, posttest, and delayed-posttest, and 3) students' satisfaction with the implementation of the QARR approach.

Discussion of Finding One: Effectiveness of the QARR Instructional Design from the Experts' Point of View

The results revealed that all of the congruence evaluation factors indicated that the QARR approach was satisfactory and promising in terms of improving students' abilities to perform reading comprehension examinations. The lessons were created following the QARR principle, with measurable goals of enhancing students' reading comprehension. Furthermore, the QARR instruction was established on the gradual release of responsibility (i.e., a session begins with more instructor control and progresses to more student engagement) (Raphael et al., 2006). The findings were consistent with Rothong (2013), who evaluated the effectiveness of QAR reading instruction and discovered that experts unanimously accepted the instructional quality.

Discussion of Finding Two: Comparison among the Reading Comprehension Scores from Pretest, Posttest, and Delayed posttest

The results showed that participants had significantly higher mean scores in the posttest and delayed-posttest than in the pretest, demonstrating that students' ability to perform reading exams improved after receiving QARR instruction. Students could process answers to questions in the posttest. The QARR strategy's analytical methods and question type knowledge assist students in monitoring their reading procedure and guiding

them to utilize an appropriate reading process for a specific question type (Kolb, 2014; Raphael & Au, 2005).

Previous studies (e.g., Aziz & Yasin, 2017; Peng et al., 2007; Thuy & Huan, 2018) evaluated the usefulness of the QAR strategy in improving students' ability to perform reading comprehension examinations. Previous research found that the experimental group had considerably higher posttest scores than the control group students. Nevertheless, the R-review component was confirmed as a great addition to helping students with reading comprehension tests. Students are encouraged to review the tasks completed to evaluate the essential idea that the question asks, question type analysis, and sources of information in the passage (Kolb, 2014). As a result, the participants in this study were more confident and could answer the questions. Furthermore, the R-review procedure aided with QARR knowledge retention in the delayed-posttest. Kaneko et al. (2019) investigated the effectiveness of developed instruction to promote cyber security education through experiential learning and discovered that students in the experimental group had significantly higher delayed posttest scores (M = 18.17) than students in the control group (M = 10.75, $p < .01$) through the review component.

Discussion of Finding Three: Students' Satisfaction toward Implementation of the QARR Approach

The third finding revealed a high level of students' agreement on the overall satisfaction items. Specifically, when inspecting each satisfaction category, the students also showed a high level of agreement in the teaching process, contents of the teaching materials, and benefits from the QARR instruction.

The QARR instruction is assumed to contribute to students' satisfaction, namely, explicit procedural steps in analyzing question types, contents in material, and the review process. The QARR instruction guided students to process the answer to a question. For example, some question types need literal information from the passage, while some ask students to process the answer based on students' inferential ability. The question-type analysis is promising to promote students' abilities in doing reading comprehension tests. Furthermore, the passages in the teaching materials were comprehensible to the students (i.e., relatively easy and relevant topics). Thus, students were not demotivated to read the passages. The last factor could be the R-review process in the QARR strategy, encouraging students

to reflect on their task for self-revision when selecting the correct answer to a quesiton (Chhouk, 2017). That is a self-monitoring process resulting in students' confidence in analyzing the question and doing the test.

The findings aligned with Wattanasuk (2016), who investigated students' satisfaction with the English reading instructional model by integrating higher-order thinking strategies. The study resulted in overall positive feedback to the instruction, classified into benefits from the QARR instruction, contents in the teaching materials, and teaching process. Moreover, activities in the Review component provided a supportive learning environment for students and lessened their affective filters.

Discussion of Finding Four: Participants' Satisfaction and Comments from Interview

The supportive findings were elicited from the interview session with six participants, who scored ten higher in the posttest, to confirm the satisfaction. The participants' comments could be classified into the teaching process, contents and teaching materials, benefits and applications, and learners' prior background in the pretest.

The most frequently found comments were concerned about *Benefits and Applications* (37.78%). The participants mentioned that the strategy helped them process the answer faster, a key factor in enhancing the posttest reading comprehension scores. For example, one participant stated "*The strategy eases the process of answering questions(Student No. 197)*" and while another mentioned, "*I used the QARR strategy and spent less time answering the question, so I could review the answer and question analysis to recheck the accuracy and spend longer processing answers for difficult questions during the tests (Student No. 186)*". The excerpts affirm that students applied the QARR strategy acquired from the instructional intervention during both the posttest and delayed-posttest. The results following Rothong's study (2013) showed that the QAR strategy educes a higher reading comprehension posttest scores.

The second most provided comments were learners' *prior background in the pretest* (31.11%), revealing the participants' negative feedback in doing the pretest. The participants could not process answers on time, indicating that students' ability to do the test needed to be improved. The findings aligned with Rothong's study (2013), revealing that the students' posttest mean scores on the English reading comprehension test were higher than the pretest. This increase implies that students need to gain knowledge of reading strategies and take time to process answers to reading questions. Reading

strategy is assumed to be an indicator to help students do the test with higher abilities.

The teaching process was the third most frequently found in the interview (20%). Students mentioned their difficulties while studying online; for example, it took more work to interact with the teacher for more explanations and feedback. Thus, these comments are constructive to help the instructors revise the instruction.

The least frequently found comments from the interview were *Contents and teaching materials* (11.11%), which showed that they needed more exercises and question samples. The data in *contents and materials* showed the students' difficulty in defining and processing answers for particular question types (i.e., *reinterpretation* and *inference*). Hence, the researchers should modify details and provide more examples of each question type in the teaching materials.

Implications of the Study

The results of the QARR instruction effectiveness provided significant implications for teachers in developing their reading instruction to promote students' reading performance, metacognitive skills, and learning behavior.

Promotion of Students' Reading Performance

According to the findings, teachers should encourage students to use the R-review in the QARR to improve their reading performance. The results showed that the QARR strategy greatly increased the students' reading scores. Furthermore, the delayed posttest score (conducted three weeks after the posttest) was slightly higher than the posttest, indicating that the QARR was beneficial in promoting the students' reading comprehension scores. Nonetheless, the findings disagree with the prior studies (e.g., Cummins et al., 2012; Kucera, 2009; Stafford, 2012), which found no significant improvement in students' reading comprehension scores after adopting the classic version of the QAR strategy. The newly constructed Review component of the lesson was seen as an additional component that improved student reading performance.

Promotion of Metacognitive Skills (Self-Monitoring)

The findings also imply that teachers should promote students' metacognitive skills (i.e., self-monitoring as a function of the review stage). The Review process, adapted from Kolb (2014) 's Experiential Learning, was included in the instruction (i.e., the QARR strategy) to encourage students to self-monitor their learning experience and improve learners' performance in answering reading test questions. The Review part consists of three cognitive tasks: 1) describing what they have done, 2) reflecting on the reading task, and 3) applying the potential knowledge to revise it. The findings from the interview asserted that the Review component helped students reflect on the task, provoke students' self-awareness on what they have learned, and revise what they have done wrong, the metacognitive skills promoting learning performance in using a reading process (Garner, 1988).

Promotion of Students' Learning Behavior

Third, teachers are encouraged to use the QARR instruction to help students improve their analytical learning skills. The QARR strategy instructs students to identify and react to a question type (Rephael et al., 2006). For example, question analysis teaches students to examine the passage for factual information to answer the literal comprehension question. Knowledge of question types and analysis assists students in determining what they can effectively execute to process a response to a specific question. As a result, teachers should use or develop reading instruction to enhance students' learning behavior in analyzing reading tasks to improve students' performance on reading examinations.

Conclusion

The study's results revealed the effectiveness of the developed QARR instruction in three aspects, including 1) approval from the experts, 2) students' significant gained scores in the posttest and delayed-posttest, and 3) students' satisfaction toward implementation of the QARR approach. These results indicated that the QARR instruction should be implemented among Thai EFL university students to improve their reading proficiency, metacognitive skills, and learning behavior. As the study concludes, future study was recommended to expand the implication of the R-review to other

language skills (e.g., listening, writing, and speaking), which are challenging for Thai EFL learners. Moreover, future researchers are encouraged to adopt the R-review notion from this study to merge with other instructional models to intensify the instructional effectiveness and lead students into higher learning achievement.

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