# THE EFFECTS OF QAR STRATEGY, DATA CHART STRATEGY, AND CRITICAL THINKING ON READING COMPREHENSION ACHIEVEMENT OF THE TENTH GRADE STUDENTS OF SMK NURUL IMAN PALEMBANG

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**Abstract**

This study aimed to investigate the effects of QAR strategy, data chart strategy, and critical thinking on reading comprehension achievement of the tenth grade students of SMK Nurul Iman Palembang. The method used in this study was factorial design. Fifty students of the tenth grade students of SMK Nurul Iman Palembang were selected as the sample in this study based on some criteria, namely, they were on the same reading level (level 3), were on the same level of critical thinking (high= 9 students, medium= 7 students, and low = 9 students) for each group, and taugth by the same English teacher. The instruments used were (1) reading comprehension test, and (2) critical thinking test. In analyzing the data, two statistical analyses were used: (1) independent sample t-test, and (2) two way ANOVA. The result of the study showed that there was no significant difference in reading comprehension between the students who were taught using QAR strategy and data chart strategy (t-value= -.171, ṗ= .865). Besides, there was a significant interaction effect between QAR strategy and students' critical thinking level on reading comprehension achievement (ṗ= .034, (<0.05). Meanwhile, there was no interaction effect between data chart strategy and critical thinking (ṗ= .998 ).

**Keywords** : *QAR, data chart, critical thinking, reading comprehension achievement*

## 1. Introduction

Reading is an active cognitive process of interaction with printed and monitoring comprehension to establish meaning (Bromley, 1992). People usually read the text to find the message or information. Whether or not they can understand about the text they read, it depends on their reading comprehension ability. Kosanovich (2013) adds that reading comprehension as the process of simultaneously extracting and involment with written language is very important since it supports students' academic performance.

Students think and try to comprehend the reading text when they read. This means, thinking skill cannot be separated from reading comprehension. NICHD

(2002) states that comprehension is the process of deriving meaning from connected text. It involves word knowledge (vocabulary) as well as thinking reasoning.

Additionally, Mohammadi, Heidari, and Niry (2012) state that one factor that may influence students' reading comprehension is critical thinking. Maurer and Arnett (2001) add that the influence of critical thinking skill is it can influence someone's success in academic life. The cultivation of critical thinking has been the focus of education for years. In line with this, UNESCO (2011) states that it is one of the most important life skills to survive in the future life.

Unfortunately, some facts also revealed that there was still a problem with Indonesian students' reading comprehension achievement and students' critical thinking. Based on PISA result in 2013, Indonesian students were in the second lowest rank in their reading literacy which was lower than the rank of the PISA in 2009 in that Indonesia was 57$^{th}$ out of 65 countries. This finding supported by the IAE (2003) revealed that reading score of Indonesian students in East Asia was low. Indonesian students were just capable of mastering 30 % reading material, and found difficulty in reading items that were in the form of commentary requiring cognitive process. In line with this, according to EGRA (2014, p.17), the second grade students' reading achievement in Indonesia was on the lowest category and 26.3% of them was reading with comprehension. Then, based on previous research done by Yanti (2013, p. 30), the result of the reading comprehension of senior high school students in Palembang was also still below average, in which there was 70 % of students who were poor in reading comprehension. Moreover, Sudarmi (2008, p. 20) found that 43,33% of the students in Palembang were in below average critical thinking.

In this study, the writer had tenth grade students of SMK Nurul Iman Palembang as the participants. For the purpose of measuring the reading level of the tenth graders, the writer administered a reading level test using Informal Reading Inventory (Roe and Burns, 2011). The result of the test was that their reading level was on level 3 (primer level).

This was in line with what was found by Haris and Sippay (1980) that many factors influence the difficulty in reading including the mastery of vocabulary, and

ability of analysis aspect of reading comprehension (main idea, inference, supporting detail, cause effect, and sequences).

Teachers need to find out appropriate strategies for teaching reading comprehension because without proper reading strategy, it is difficult for students to understand a reading text. Afflerbech, Pearson, and Paris (2008, p. 368) state that it is important to note that reading strategies are indeed needed to help students decode and understand text successfully. In line with this, question-answer relationship and DC strategies are very helpful for students of reading comprehension achievement.

The objectives of this study were to find out whether or not: (1). There were a significant difference in reading comprehension achievement between the tenth grade students of SMK Nurul Iman Palembang who were taught by using QAR strategy and those who were taught by using DC strategy., (2). There was a significant interaction effect between QAR strategy and critical thinking on reading comprehension achievement of the tenth grade students of SMK Nurul Iman Palembang. If there was a significant interaction effect, whether or not there was any significant difference among the students who had high, medium, and low level of critical thinking., and (3). There wa a significant interaction effect between DC strategy and critical thinking on reading comprehension achievement of the tenth grade students of SMK Nurul Iman Palembang. If there was a significant interaction effect, whether or not there were any significant difference among the students who had high, medium, and low level of critical thinking.

## 2. Theoretical Background

Question-Answer Relationship (QAR) promoted its benefit for students in solving some students' reading problems. Raphael and Au (2005, p. 206) have asserted "the potential of QAR for helping teachers guide students to higher levels of literacy." Peng, Hoon, Khoo, and Joseph (2007) also report that QAR was appropriate reading strategy in helping students to classify question types, and monitor their comprehension. In line with this, Fisher and Frey (2004) add that QAR empowers students to think about the text they are reading. It inspires them

to think creatively and work cooperatively while challenging them to use literal and higher-level thinking skills.

Antonacci and O'Calaghan (2012, p. 281) also promoted the benefits of Data Chart (DC) that provide students with a method to organize information. Due to its benefits, the writer was interested in conducting the present research using Question-Answer Relationship and DC as strategies.

## 3. Method

In this study, a factorial design was used. There were two groups in the study; the first experimental group was given a treatment using QAR strategy and the second experimental group was given a treatment using DC strategy. A factorial design was used to study the independent and simultaneous effects of two or more independent treatment variables on an outcome (Creswell, 2005, p. 298). Fraenkel and Wallen (1990) also state that factorial design extend the number of relationship that may be examined in an experimental study.

Referring to the problems and objectives of this study, there were four variables. The first was QAR strategy as the independent variable. The second was DC strategy as the other independent variable. The students' reading comprehension achievement was the dependent variable, and students' critical thinking was the moderator variable.

Cornell Critical Thinking form X was used to find out the level of critical thinking in selecting the sample. From 50 students, the sample was selected based on the following criteria;(1) the students were taught by the same teacher, (2) the students relatively had somewhat the same age (15-16 years old), (3) the students had the same numbers of category (low, medium and low). To score the level of students' critical thinking, Cornell Critical Thinking Dispossition form X was used. The students who scored high, average, and low in doing the test were equally divided into two groups. Therefore, the first group consisted of 9 students who scored high, 7 students who scored average, and 9 students who scored low, and the second group consisted of 9 students who scored high, 7 students who scored medium, and 9 students who scored low.

Reading comprehension test was administrated to know about students' English reading comprehension before the treatment and post-test was administered to know about the students' reading comprehension after the treatment. The test items in the pre-test were the same as those of a post-test because the purpose of giving them was to compare between students' reading achievement before and after the treatment. Before doing pre-test, the students were tested to see their reading comprehension level by using *Informal Reading Inventory* test (IRI). IRI was a standard reading level test made by Roe and Burns in 2011. It was found that the reliability of the reading comprehension test with Cronbach Alpha was .881.

## 4. Result and Discussion

*Pair Sample T-Test Analysis*

Paired sample t-test was used to find out whetheher or not the reading comprehension achievement of tenth graders of SMK Nurul Iman Palembang academic year 2014/2015 was improved after they were taught using QAR and DC strategies. The students' reading comprehension achievement was improved if $t_{table}$ is higher than ṕ values (sig 2-tailed) from the two groups which are less than 0.05.

Based on the result of paired sample t-test, it was found that the mean difference between pretest and posttest scores within QAR group was 16.76, the $t_{obtained}$ was 5.137 with df 24 and significant value was .000 (<0.05). QAR strategy significantly improved reading comprehension achievement and its four aspects (main idea, inferences, cause effect, and sequences), but there were two aspects (detail questions and vocabulary) which were not significantly improved. Furthemore, within DC group, it was found that the mean difference between pretest and posttest scores was 10.00, the $t_{obtained}$ was 4.382 with df 24 significance value was .000 (<0.05). Therefore, from thre result of pair sample test, DC strategy also significantly improved reading comprehension achievement (total) and its three aspects (main idea, vocabulary, and sequences), but there were three aspects (inference, detail question, cause effect) were not significantly improved (see Table 4). From those findings, it can be stated that the null hypothesis ($H_0$) was rejected and alternative hypothesis ($H_a$) was accepted which means there was a significant

difference in reading comprehension achievement of the tenth graders of SMK Nurul Iman Palembang who were taught by using QAR strategy and those who were taught by using DC strategy.

*Independent Sample T-Test Analysis*

To test whether or not there was a significant difference between QAR group and DC group, independent sample t-test was used. There was a significant difference if the ṗ value (sig 2-tailed) was less than 0.05. Independent t-test result showed that the mean difference between posttest score between QAR and DC groups was -.560, the $t_{obtained}$ (-.171) with df 48 and significant value was .865 (<0.05). From those findings, it can be stated that the alternative hypothesis ($H_a$) was rejected and null hypotheses ($H_0$) was accepted which means there was no significant difference between QAR and DC groups in term of posttest results; there was no significant difference in total score, but two aspects (main idea and inference) were different significantly.

*Two-Way ANOVA Analysis*

In this study, students' critical thinking levels were used as moderator variable that was considered as another factor that might influence the students' reading comprehension achievement.

Two-way ANOVA test was used to analyze whether there was a significant interaction effect between QAR strategy and critical thinking and whether or not there was a significant interaction effect between data chart strategy and critical thinking. There was a significant difference if the ṗ value (sig 2-tailed) was less than 0.05. Two- way ANOVA result showed that the mean square between QAR and critical thinking was 29.485 with df 4 and significant value was .034 (<0.05). From those findings, it can be stated that there was a significant interaction effect betweeen QAR strategy and critical thinking. Based on the second research problem, if there was a significant interaction effect, therefore there were any significant differences among the students who have medium, high, low level of critical thinking on reading comprehension achievement. Two-way ANOVA result

showed that there was a significant difference in reading comprehension achievement between students who were on high critical thinking level and students who were on low critical thinking level with Sig= 0.004 ( <0.05) and it was also found that there was a significant difference in reading comprehension achievement between students who were on high critical thinking level and students who were on average critical thinking level with Sig= 0.004 (<0.05). On the contrary, result showed that there was no significant difference in reading comprehension achievement between students who were on average level and students who were on low level with sig.753.

Meanwhile, it was found that there was no interaction effect between DC strategy and critical thinking. Two-way Anova result showed that the mean square between DC strategy and critical thinking was 1.981 with df 3 and significant value was .998. Therefore, it can be stated that there was no significant interaction effect between DC strategy and critical thinking.

**5. Discussion**

Based on the result of paired sample t-test, it was found that QAR strategy significantly improved reading comprehension achievement and its four aspects (main idea, inferences, cause effect, and sequences), but there were two aspects (detail questions and vocabulary) which were not significantly improved. DC strategy also significantly improved reading comprehension achievement (total) and its three aspects (main idea, vocabulary, ans sequences), but there were three aspects (inference, detail question, cause effect) were not significantly improved.

Furthermore, the researcher took critical thinking level as moderator variable that might give contribution on the students' reading comprehension achievement. The result of students' critical thinking showed that these students were divided into three categories, ie; high level (36%), average level (28%), and low level (36%). In total, the result showed that there was a significant interaction effect between QAR strategy and critical thinking. Besides, it was found that there was a significant difference in reading comprehension achievement between students who were on high critical thinking level and students who were on low

critical thinking level, between students who were on high critical thinking level and students who were on average critical thinking level. Thus, it could be concluded that QAR strategy and critical thinking significantly affected reading comprehension achievement of the tenth grade students of SMK Nurul Iman Palembang. Raphael and Au (2011) state that the benefits of QAR strategy that elicits students' prior knowledge of the topic of the text, sets a purpose for critical thinking, and helps students to monitor their comprehension. From those findings, researcher interpreted that the students on high critical thinking were easier to apply QAR than others because of their high critical thinking. Rayhanul (2015) explains that students have high critical thinking think more logically, more systematicaly, and "outside the box" so that they can apply QAR easliy. Then, students on average critical thinking needed more time to apply and more understand the purposes of QAR strategy on reading comprehension achievement. Meanwhile, the students on low critical thinking were interested enough in QAR strategy as a new strategy for them so that they were challanged to apply it.

In DC strategy result, it was found that there was no significant interaction effect between DC strategy and critical thinking. It could be concluded that DC strategy significantly affected reading comprehension achievement meanwhile critical thinking did not affect students' reading comprehension achievement.

## 5. Conclusions and Remark

Based on the result of the pair sample t-test and independent sample t-test, it can be concluded that both QAR and DC strategies can significantly improve students' reading comprehension achievement. QAR strategy was as good as DC strategy in improving the students' reading comprehension achievement. QAR strategy can help the students to think about a text they read critically, while DC strategy can help the students to build their vocabulary base effectively.

Based on two-way ANOVA result, it is not only QAR strategy that significantly affected reading comprehension achievement of the tenth graders of SMK Nurul Iman Palembang but also students' critical thinking. DC strategy also

significantly affected reading comprehension achievement although students' critical thinking did not affect students' reading comprehension achievement.

In conclusions, QAR and DC strategies are good strategies which can be used to teach reading comprehension. Especially for QAR strategy, it was a good strategy to teach students to read critically. These strategies are not only good for teaching reading comprehension but also for teaching science, and mathematics.

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