# THE EFFECT OF LEARNING STRATEGIES AND COGNITIVE LEARNING STYLE ON STUDENTS' READING COMPREHENSION

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## ABSTRACT

*There were three objectives of this research: 1) there was significance difference between students who are treated by discovery learning strategy and those who are treated by direct instruction learning strategy on reading comprehension, 2) there was a significant difference between impulsive and reflective students on their reading comprehension, 3) there was a significant interaction between learning strategies and students' cognitive learning style on reading comprehension. There were two stages of sampling: cluster random sampling and purposive sampling. There were two instruments used in this research: multiple-choice test and questionnaire. Then the data were analyzed by two-way ANOVA. Three conclusions are drawn as the result. First, there was significance difference between students who are treated by discovery learning strategy and direct instruction learning strategy on reading comprehension. Second, there was a significant difference between impulsive and reflective students on their reading comprehension. Third, there was a significant interaction between learning strategies and students' cognitive learning style on reading comprehension. The data also showed that discovery learning strategy was more effective than direct instruction learning strategy. In addition, Reflective students learn more effective than impulsive students to read a text.*

**Keywords:** *Reading Comprehension, Learning Strategies (discovery and direct instruction learning), and Cognitive Learning Style (Impulsivity and Reflectivity)*

## INTRODUCTION

Reading is one of the required skills by the curriculum in Indonesia considered essential to be mastered in language learning. However, the result of the teaching of reading comprehension is often unsatisfied. In other words, the process of learning and teaching

reading comprehension is considered unsuccessful. Based on the writer's preliminary research at SMPIT AL-MUFTI Tangerang, most students of grade eighth have problems with reading comprehension as indicated by score of reading test. To overcome the problems, the writer proposes implementing appropriate strategies namely discovery learning and direct instruction leaning strategies because they are assumed as appropriate learning strategies to solve the students' reading problems. Discovery learning is considered as an effective learning strategy to solve students' problems and dependency on the teacher's instruction.

In addition, discovery learning is also suggested in K13 (Kurikulum 2013). Meanwhile, discovery learning is often criticized as it can make students feel difficult in reading when students have no or little prior knowledge or background information about the topic being discussed. It is therefore direct instruction is also considered important to be implemented. Unlike discovery learning, direct instruction learning is a teacher-centered which the teacher dominates the learning and teaching process.

However, there might be another factor that influence on reading comprehension besides learning strategies namely cognitive learning style. This factor deals with ways of the students think to solve their problem. in this research the writer focuses on only investigating reflectivity and impulsivity individual because of several reasons: 1) they are supported by a lot of theories and previous research studies that can be the basis of this study, 2) reflective and impulsive students will bring different results on understanding a text, and 3) indentifying reflectivity and impulsivity of students will bring informative inputs for the teachers to select the appropriate learning strategies on reading comprehension.

This research belongs to factorial design. Factorial design refers to an experimental research which is related to the number of relationships. It is as also supported by Cohen, Manion and Marrison (2007:280), factorial design may consist of two or more independent variables on one dependent variable. It is usually used 2 x 2 designs which consist of two independent variables with two values. This factorial design could be conducted either post-test only or pre-test and post-test, Cohen, Manion and Marrison (2007:280), but the writer implemented only post-test because it is enough to answer the research questions purposed.

The sampling was administered into clustering random sampling and purposive sampling. The clustering sampling was to determine the two classes, one was treated by implementing discovery learning strategy and the other was treated by implementing direct instruction strategy. Clustering random sampling was conducted since it was hard to select individual sampling and place the students in new classes Franken, Wallen and Hyun (2007:96). In addition, purposive sampling was to determine impulsive and reflective

students because this research focused on investigating reflective and impulsive students.

Franken, Wallen and Hyun (2007:100) also support that purposive sampling is taken because of the specific purpose of the research. Therefore, there were 44 students for this research sampling. The writer used multiple choice-tests to measure the students' reading comprehension. There were 60 test items made with 4 options A, B, C, and D and questionnaire to identify students' cognitive learning style. Those instruments were tested validity and reliability. The result showed that those instrument were valid and reliable. In this research, the analysis was conducted by using two-way ANOVA. Two-way ANOVA is used to examine the effect of two factors (independent variables) of interest on the dependent variable and interaction between the different levels of two factors.

**FINDINGS & DISCUSSION**

Based on test of the three hypotheses that have been proposed, it was found that there were significant different among all variables.

**Tests of Between-Subjects Effects**

Dependent Variable: Reading Comprehension

| Source | Type III Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 2475.886a | 3 | 825.295 | 16.323 | .000 |
| Intercept | 220244.750 | 1 | 220244.750 | 4356.185 | .000 |
| Cognitive Style | 1872.023 | 1 | 1872.023 | 37.026 | .000 |
| Learning Strategies | 390.023 | 1 | 390.023 | 7.714 | .008 |
| Cognitive Style | 213.841 | 1 | 213.841 | 4.230 | 046 |
| Error | 2022.364 | 40 | 50.559 | | |
| Total | 224743.000 | 44 | | | |
| Corrected Total | 4498.250 | 43 | | | |

a. R Squared = 550 (Afjusted R Squared = 517)

First, there was significant difference between students who were treated by discovery learning strategy and direct instruction learning strategy on reading comprehension. It was supported by the p-value of learning strategies is 0.008. It means that the p-value of learning strategies is smaller than α 0.05. In addition, the data is supported by the Fobserved in which The Fobserved learning strategies 7.714 is higher than Ftable 4.08. The significant different development in reading comprehension might be caused of different procedure to use those learning strategies. The process of implementation is totally different. Discovery learning is a learning process which emphasizes students-centered in which students take more learning actions actively than the teacher does, and task-based approach in which students learn

English language by interacting communicatively and purposefully with other students and teacher while engaged in the activities and tasks (Akerson:2007).

The strategy allows students to build their own knowledge and the students learn effectively when they get involved in the classroom activity because the sequences provides introduction, generating ideas, learners' explorer, sharing, clear-up and care, and extension, (El-Kahlout:2010) and Adkisson and McCoy (2006).

Meanwhile, Direct instruction strategy is teacher-centered in which a teacher plays an important role to give examples, provide practice and feedback, and finally assess the students whether the students comprehend a text or not, whether the lesson needs to be emphasized or not (Ryder et al:2006 and Shippen et. al:2005). This strategy leads the struggling students to understand a text by informing classroom task orderly because it provides model, lead and test, (Engelmann and Carnine:1982, Schug et al:2001 and Shippen et. al:2005) As the result, there was a significant differences result between the students who were treated by discovery learning and who were treated by direct instruction learning.

In addition, the data also indicated that the mean score of discovery learning 74.7 was actually higher than the mean score of direct instruction learning 67.7. In other words, discovery learning strategy was more effective than direct instruction learning strategy for the eighth grade students of SMPIT AL-MUFTI Tangerang because the students enjoyed learning based on investigating instead of being explained by the teachers. They actively involved on learning program in which students take more learning actions actively than the teacher does, and task-based approach in which students learn English language by interacting communicatively and purposefully with other students and teacher while engaged in the activities and tasks that makes students fun in doing reading comprehension. In addition, the implementation of discovery learning proves that the process of learning and teaching reading comprehension is considered unsuccessfully in which students do not always depend on the teacher's instruction and make them curious to discover a text they read instead of instructing by the teacher. Meanwhile, in direct instruction learning the students tended to be passive students in which students listened the teacher' explanation, did practices and tests. The students have limited activities because teacher dominated and played an important role to give examples, provide practice and feedback, and finally assessment, (Ryder et al: 2006)

Furthermore, the result of this research was also supported by Indonesian Education system which states that in order to enhance students creating contextual assignment either individually or cooperatively in language learning, discovery learning strategies should be

implemented in language teaching (Depdiknas:2013). In addition, some previous research studies conducted by El – Kahlout (2010) showed that there were statistically significant differences between students who were taught by discovery learning and who were taught direct instruction in reading comprehension skills. The results also showed that there were significant differences between the levels of reading comprehension skills for the experimental group compared with the control group. In other words, discovery learning strategy improved students' reading comprehension for the eleventh grade students in Gaza.

Similarly, Balim (2009) investigated the effects of the discovery learning strategy on the students' perceptions of inquiry learning skills, academic achievements, and retention of knowledge for 77 students at the seventh grade. The result showed that there was a significant difference between experimental group and the control group regarding the average of academic achievement, scores of retention of learning, and perception of inquiry learning skills scores, both on cognitive and affective levels. In other words, discovery learning improved on students' success in learning. The two previous studies have similar results to what the writer have that discovery learning are better for students on reading comprehension, but the writer focused on only impulsive and reflective students; meanwhile the two previous studies above took all students in two classes than compared between discovery learning and direct instruction.

On the other hands, these findings rejected several research studies conducted by Klahr and Nigam (2014). Their research investigated the effect of direct instruction and discovery learning for 122 students in third and fourth grade. The result showed that many children learned much better in direct instruction than in discovery learning. In other words, children who learned through direct instruction learning strategies performed better than those children who learned through discovery learning strategies on their own. Furthermore, Cohen (2008) investigated the effectiveness of discovery learning compared with direct instruction for the second grade students.

The results indicated that the students in the direct instruction group scored higher on the assessment test, but this was not statistically significant. The other two previous studies showed different result. It might be implemented in different grade of school in which the two previous studies for children while the writer implemented for teenagers. It means that the children prefer learning through teacher-centered to student-centered while teenagers do not either. The different age of students results differently even though they are treated with the similar learning strategies. It is also viewed by Murray and Christionson (2011:70) that young learners and teenagers are diverse because they come from different aged and learn English in many varied context.

Second, the results indicated that there was significant difference between impulsive and reflective students on reading comprehension. It was supported the p-value of cognitive learning styles is 0.000. It means that the p-value of cognitive learning style is smaller than α 0.05. It is also supported by the Fobserved in which The Fobserved cognitive learning style 37.026 is bigger than Ftable 4.08. The significant different result in reading comprehension was caused of the different general principles of cognitive learning style between impulsive students and reflective students on reading comprehension in which impulsive students tend to complete their comprehensive question quickly and they consider inaccuracy to complete them because they often recheck before submitting them. By contrast, reflective students are slow learners who often calculate and think before acting or speaking; as the result, they tend to make a few errors to complete their job, (Suparman, 2010:58, Kagan, 1966, Brown, 1997:106, and Fazilatfar, 2010:19).

As the result, the different character between impulsive and reflective students resulted different way to react and learn reading comprehension. Therefore, impulsive and reflective students have different view and general principles of cognitive learning style according to the ways they reacted, learned and solved the problems in learning. In addition, the data indicated that there was a difference between the impulsive learners and reflective learners on their reading comprehension with the mean score 64.227 compared to 77.273.

In other words, reflective students were more effective than impulsive students on reading comprehension for the eighth grade students of SMPIT AL-MUFTI Tangerang. This finding was also supported by Tabrizi and Iranpour (2015) who investigated the effect of awareness-raising training on Iranian intermediate EFL learners' reading comprehension with a Focus on Reflective and Impulsive Learning Style for 150 intermediate EFL learners in male and female learners. The result indicated that reflective learners showed a higher mean score on the reading test given than impulsive learners.

Similarly, Bazargani and Larsari (2013) investigated the influence of impulsivity reflectivity, gender and performance on multiple choice items. The result showed that impulsivity and reflectivity cognitive styles of students influence on their performance on multiple-choice items test in which reflective students showed better scores. In addition, the result showed that students' sex does not affect on their performance on multiple-choice item test. Furthermore, Kagan (1966) also reported that impulsive students tend to make decision quickly, but no accurately. As the result, they will make many errors to complete tasks or answering comprehensive question. Meanwhile reflective students are vice versa.

On the other hands, this findings rejected several research studies conducted by Grapanchi and Dashti (2011) who investigated whether Impulsivity/Reflectivity correlated

to Display Referential, and Inferential reading comprehension for 100 newcomer students. The result showed that there was no significant difference Impulsivity/Reflectivity to their performance in display, referential and inferential reading comprehension questions. Accordingly, Nietfeld and Bosma (2003) investigated the correlation between impulsive and reflective on students' academic tasks. The result showed that there was no correlation between impulsivity towards task, but there was correlation between reflectivity towards task.

Moreover, Erginer (2014) also investigated students' reading comprehension and their cognitive learning style focused on impulsivity and reflectivity. The result showed that learning styles do not have a significant effect on reading comprehension skills. Third, the finding indicated that there was significant interaction between learning strategies and cognitive learning style on reading comprehension. It was supported by the p-value of interaction is 0.046. It means that the p-value of interaction is smaller than $\alpha$ 0.05. Furthermore, it is supported by the Fobserved in which the Fobserved interaction 4.230 is bigger than Ftable 4.08. In other words, implementing those learning strategies only is not enough, teachers should consider students' cognitive learning style on reading comprehension namely impulsivity and reflectivity.

The way they solve the problem refers to cognitive learning style that every individual differently posses to solve their own problem in their part of learning or life. The different learning style and learning strategies implemented resulted differently because the way they perceive, react, face and solve problems was different, based on their own cognitive style. In addition, the result was supported by Shi (2011) who investigated the relationship between cognitive styles and learning strategies with 184 second-year English majors from the Foreign Language School of a university in Wuhan. The result showed that cognitive styles have significant relationship on students' choices of learning strategies. In other words, the students could learn best if the learning strategy is suited to their cognitive learning style. Similarly, Cesur (2011) investigated the interaction between language learning strategies, learning style and success in reading comprehension with 368 samples from 8 different universities in Turkey. The result showed that there was significant interactionbetween language learning strategies and learning style on success reading comprehension.

On the other hand, the finding also rejected a study conducted by Tsai (2012) who investigated the relationships among cognitive learning style, motivation, and strategies use in reading English as Foreign language with 422 Taiwanese undergraduate levels. The result showed that there was a strong correlation between motivation, reading strategy use and reading performance, whereas no correlation between learning styles and reading performance was confirmed. Moreover, learning styles, motivation and reading strategies

were inter-correlated with each other. Similarly, Al-Hajaya (2013) investigated the effect of cognitive learning style-based reading program on achievement of 104 Jordanian freshman English majors. The result indicated that there was no statistically difference interaction between cognitive learning style and instructional strategy. Hsieh and Dwyer (2009) also investigated the effect of reading strategies and learning style on 169 students' academic achievement.

Based on the analysis, it was found that there was no significant interaction between reading strategies and learning style. In other words, not all types of reading strategies are actually effective in facilitating different types of cognitive learning style.

## CONCLUSION

Based on the research hypotheses and the data analysis discussed previously dealing with the research. The writer drew three conclusions based on the data found to answer the three formulation of the research and they were also supported by other previous research studies as follows:

First, the findings indicated that there was significant difference between students who were treated by discovery learning strategy and those who were treated by direct instruction learning strategy on reading comprehension because they were implemented differently. The significant different development in reading comprehension might be caused of different procedure to use those learning strategies. The process of implementation is totally different as discussed previously. Discovery learning is a learning process which emphasizes students-centered in which provides introduction, generating ideas, learners' explorer, sharing, clear-up and care, and extension as stated in procedure of discovery learning.

Meanwhile, Direct instruction strategy is teacher-centered in which a teacher plays an important role to give examples, provide practice and feedback, and finally assess the students whether the students comprehend a text or not. As the result, there was a significant differences result between the students who were treated by discovery learning and who were treated by direct instruction learning. Therefore, those learning strategies implemented had different view and results according to what they have learned. Other possible factors which differentiate those two learning strategies are essentially needed to be further investigated.

Second, the finding indicated that there was significant difference between impulsive and reflective students on reading comprehension because the different cognitive learning style made the way of learning differently. The significant different result in reading comprehension was caused of the different general principles of cognitive learning style

between impulsive students and reflective  students on reading comprehension in which impulsive students  tend to complete their comprehensive question quickly and they consider inaccuracy to complete them because they often recheck before submitting them. By contrast, reflective students are slow learners who often calculate and think before acting or speaking; as the result, they tend to make a few errors to complete their job. As the result, the different character between impulsive and reflective students resulted different way to react and learn reading comprehension.

Therefore, impulsive and reflective students have different view and general principles of cognitive learning style according to the ways they  reacted, learned and solved the problems in learning. Other possible factors which differentiate impulsive and reflective students on reading comprehension are essentially needed to be further investigated.

Third, the finding indicated that there was  significant interaction between learning strategies and cognitive learning style on reading comprehension because implementing those learning strategies only is not enough, teachers should consider students' cognitive learning style on reading comprehension namely impulsivity and reflectivity. Therefore, English teachers should not ignore learning strategies and students' cognitive learning styles on students' reading comprehension and the learning strategies chosen, cognitive learning style had influential factors on reading comprehension.

As the result, the interaction between learning strategies and cognitive learning style influence on reading comprehension. Other possible factors which the interaction on reading comprehension are essentially needed to be further investigated.

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