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The Effect Of Reciprocal Teaching Internet And Cognitive Style On Student Learning Results

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Abstract- The research aims to prove the differences in learning outcomes in the adoption of learning strategies (internet reciprocal teaching and direct instruction) and cognitive styles (field independence and field dependence). Another objective of this research is to prove the effect of interaction of learning strategies and cognitive styles on learning outcomes. The research uses quasi-experimental design with 99 research subjects in level II physical and health education study programs at Nusantara University PGRI Kediri Indonesia. The instruments used were written and practice test instruments and cognitive style instruments in research using the Group Embedded Figures Test (GEFT). Hypothesis testing uses two-way 2 x 2 analysis of variance (ANOVA). The findings in this study are (1) there are significant differences in student learning outcomes between those receiving internet reciprocal teaching and direct instruction in computer application courses, (2) there are differences significant student learning outcomes between those who have cognitive independence and field dependence in computer application courses. (3) there is no interaction between learning strategies and cognitive styles. the final conclusion of reciprocal teaching internet learning strategies does not depend on the learner's cognitive style. In recent studies, reciprocal teaching internet learning strategies are rarely used other than language learning, and cognitive styles are rarely discussed together in computer application courses. Therefore, this study analyzes the interaction between learning strategies and cognitive styles on learning outcomes. Based on the results of the study, this study proposes several discussions and suggestions for the use of internet reciprocal teaching learning strategies as an alternative in the selection of learning strategies in other subjects. Learning is expected to choose the learning strategy is also based on the characteristics of students so that they will get optimal learning results. Utilization of the internet as a source of learning provides more challenges for students, learners, and all university academics to better optimize the internet in teaching and learning. These suggestions are for future research.

Keywords: *internet reciprocal teaching, direct instruction, cognitive style, learning outcomes*

I. INTRODUCTION

To optimize the function of Information and Communication Technology (ICT), especially the internet in learning, collaboration between learners and software developers is needed in order to accommodate learners' demands. Of course academics must have a greater role in institutional strategies in this field and "top down" strategies that determine the potential impact on the future application of ICT for teaching and learning (Eynon, 2005). The internet is not only used in the process of learning interactions but also as a vast learning resource as well as a facility to publish research results, papers and curricula that are different from traditional methods, eliminating the constraints of space and time. The internet can provide global facilities to provide virtual environments and real-time simulations (Jefferies & Hussain, 1998). Learner knowledge can be increased using learning resources on the internet (Ekayana, 2015). Student achievement increases due to the large amount of information obtained from the internet (Setiyani, 2010). The independent learning approach was made to support the continuity of teaching and learning communication in the classroom and outside the classroom. Place and time are not an obstacle. Learners set their own time to study the material.

Learning strategies that utilize the internet in the teaching and learning process, one of them is Internet Reciprocal Teaching (IRT). IRT uses new literacy skills to teach reading comprehension on the internet. Because the use of the internet online requires additional skills to effectively read, write, and learn (Leu, Zawilinski, Forzani, & Timbrell, 2014). IRT is rooted in Reciprocal Teaching (RT). In RT the students take turns facilitating group members in the process of predicting, clarifying, asking, and summarizing text or information. This process also occurs in IRT, but there is an important difference in IRT in that each student is likely to get a different source (Leu et al., 2014). At IRT students discuss with group members and learners provide motivation and facilitate. Students are responsible for building their own knowledge.

The characteristics of the subject matter content, student characteristics, and the learning process also determine learning success. Bloom mentioned student characteristics, quality of learning and learning outcomes are interrelated (Havighurst, 1976). Degeng (2013) aspects or personal qualities of students are characteristics of students. Students have the characteristic ability to study different material or problems for each individual. The learning characteristics of the students raised by this study are cognitive styles. Cognitive style often determines the way a student processes information or subject matter obtained from learning or the teacher during his study. According to Woolfolk (2008) cognitive style is a way for students to receive and process information. Cognitive style is described as a way for students to process information (Degeng, 2013).

Learning is designed considering the variables of learning conditions (cognitive style) (Joyce, Weil, & Calhoun, 2009). Maximizing learning outcomes can be achieved by linking cognitive style factors, methods, goals and material. There are many types or dimensions of cognitive style, according to Bruner, Goodnow, and Austin (Degeng, 2013) introducing

cognitive style focussing and scanning. Kagan (1987) distinguishes cognitive styles from being reflective and impulsive. The third type of cognitive style is given by Witkin, Moore, Goodenough, & Cox (1977) by calling it field independence (FI) and field dependence (FD) or other designations of articulated or analytic cognitive styles and global cognitive styles. Meanwhile Ausburn & Ausburn (1978) suggested that cognitive style refers to students' cognitive processes related to understanding, knowledge, perception, thoughts, imagination, and problem solving. Field dependence and field independence, as one dimension of cognitive style, have been widely studied and are seen as one of the most significant factors when discussing educational problems (Ausburn & Ausburn, 1978; Witkin & Goodenough, 1981).

The types of cognitive style in this study are field independence (FI) and field dependence (FD) which refer to the analytical and global approaches. The cognitive style of FI type students can distinguish forms as something that is inseparable from their background. Contrary to the type of FD that looks at things in a different way. One indicator of the cognitive style that students have is self-confidence in expressing ideas or answers, there is also a lack of confidence or even do not want to convey the results of their work even though the student is correct in completing the task. Based on observations on the Computer Application course it can be concluded that mayo

II. RESEARCH METHOD

This research was designed with a quasi-experimental design and the design used was a 2x2 factorial design with a Non-equivalent Control Group Design selected with the consideration that the experimental group and the control group of the research subjects could not be selected randomly (without random) assigment) and both groups were given pretest and posttest (Creswell, 2012)

The research subjects were all level II students of the 4th semester Physical Education and Health study program, Faculty of Education and Education, Nusantara University PGRI Kediri. Determination of research subjects using cluster random sampling techniques (Creswell, 2012; Setyosari, 2013). Next determine the class that will get treatment of reciprocal teaching internet learning strategies and direct instruction set with a lottery system. The number of students used as research samples is 99 people. A total of 47 people in the experimental class and 52 people in the control class. Based on the cognitive style of Field Dependence as many as 35 people and Field Independence as many as 64 people. The research instruments used to collect data in this study consisted of two types, namely (1) learning outcomes instruments were written and practice tests (pretest and posttest) (2) cognitive style instruments in research using the Group Embedded Figures Test (GEFT) instrument.

To analyze the research data used inferential statistical analysis techniques. Inferential statistical analysis technique used is the analysis of variance (ANOVA) two 2 x 2 paths. Testing of statistical values is carried out at a significance level of 5%.

III. ANALYSIS AND RESULT

Table of Test Results of Two Path Variant Analysis

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	2634,451[a]	3	878,150	11,208	,000
Intercept	350420,007	1	350420,007	4472,342	,000
Group	812,809	1	812,809	10,374	,002
Cognitive Style	1252,410	1	1252,410	15,984	,000
Cognitive Style * group	204,879	1	204,879	2,615	,109
Error	7443,506	95	78,353		
Total	407253,960	99			
Corrected Total	10077,956	98			
a. R Squared = ,261 (Adjusted R Squared = ,238) b.					

From the table above to test the first hypothesis, namely to see the differences between groups given the reciprocal teaching and direct instruction internet learning strategies, the significance value of 0.002 or less 0.05 is obtained. Thus the null hypothesis is rejected, so there are significant differences in student learning outcomes between those who get internet recoprocal teaching and direct instruction in computer application courses. In testing the second hypothesis which wants to see differences in learning outcomes between students who have a cognitive style of field dependence and field independence, the table above shows a significance value of 0,000 or less than 0.05. So the null hypothesis is rejected, so there are significant differences in student learning outcomes between those who have the field independence cognitive style and the field dependence on computer application courses.

This third hypothesis test null hypothesis is accepted. This can be seen from the calculation results in the table above where a significance value of 0.109 is obtained more than 0.05 to look for interactions between learning strategies and cognitive styles. So it can be concluded there is no interaction between learning strategies and cognitive styles in computer application courses.The first research findings, from the results of the hypothesis test showed that there were significant differences in student learning outcomes between those receiving internet reciprocal teaching and direct instruction in computer application courses. Reciprocal teaching internet learning strategies are better than students who are given direct instruction learning strategies. The research findings are in line with what has been previously studied about the benefits of reciprocal teaching assisted by Vpen technology in writing programming languages to improve learning outcomes (Shadiev et al., 2014). Findings from previous studies also suggest reciprocal teaching internet strategies influence learning outcomes (Chen & Kong, 2017). Internet reciprocal teaching has brought a number of

benefits in teaching reading skills, online understanding and strategies related to new literacy. Specifically, the benefits of the reciprocal teaching internet model include creativity, communication, collaboration, critical thinking, and understanding (McVerry, Zawilinski, & O'Byrne, 2009). Multimedia resources on the Internet are widely available to support reading comprehension with traditional learning difficult to obtain (Leu et al., 2008). These additional media sources also require new reading skills and strategies to effectively exploit the potential of learners (Leu & Timbrell, 2014).

Meanwhile, the direct instruction strategy emphasizes the giving of concepts only from learners to learners so that students in the learning process are only as audiences, do not play an active role in learning activities (Reigeluth & Beatty, 2017; Slavin, 2006). This causes the reciprocal taching internet strategy better than the direct instruction strategy.

In computer-based learning, how to use and how the information in it is presented can affect the effectiveness of learning (Card, Moran, & Newell, 1983; Winn, 2002). The researcher emphasizes that the form of messages influences what information is attended and felt by students, especially in the early stages of information processing (Winn, 2004). Glynn & Britton (1984) state that reading and extracting important information from learning texts involves a number of cognitive processes. These processes are related both to the content of the text and its physical characteristics. They also point out that limited working memory capacity requires students to make a distinction between important information and enriched or irrelevant content.

The second finding shows that there are significant differences in student learning outcomes between those who have the field independence cognitive style and the field dependence on computer application courses. In this study students who have a field independence cognitive style have better learning outcomes compared to students who have a field dependent cognitive style. Tinajero & Páramo (1998) conclude that field dependence and field independence are related to the achievement of overall learning outcomes. Woolfolk (2008) argues that a learner who has a cognitive field dependent style (FD), the global perceptual feels a heavy burden, is difficult to process, is easy to perceive when information is manipulated according to the context. A person who has a cognitive field independence (FI) style, articulation will perceive analytically, he will be able to separate the stimulus in its context, but the perception is weak when context changes occur. Individuals in the FI category usually use internal factors as direction in processing information. People who do FI work in chronological order. Witkin et al. (1977) stated that field independence students were significantly better than field dependent students in mathematics, science, engineering, and architecture. So that students who have the cognitive field independence style are superior to computer application materials, especially MS. Word.

Most likely, learners whose field style cognitive independence tends to pay attention to details and have greater analytical and differentiating abilities compared to field dependent students, who tend to view events globally without considering the details, such as receiving all parts of a text message without focusing attention on important information. As a result, when an assignment requires attention to important words and phrases embedded in a

computer screen full of information, students who are field dependent may need additional help to guide their attention to important information. Davis (1991) states that field dependent students are less efficient in analyzing, organizing, encoding, and processing information.

Ausburn & Ausburn (1978) also state that if individuals face a task that requires information processing in a way that they cannot achieve because of their cognitive style, then appropriate learning must be designed to help individuals overcome the difficulties of processing this information. Future research must be carried out to examine individual differences in information processing, especially in memory and attention, which will directly impact the design of learning strategies aimed at accommodating the shortcomings of learners who are field dependent (Tinajero & Páramo, 1998). The results of this study are relevant to those conducted by Musya (2015), this study reveals that students who have a field independence cognitive style get higher learning outcomes than students who have a field dependent cognitive style. This research shows that cognitive style can have a significant influence on student academic achievement and has an influence on academic achievement in certain disciplines.

Lee (2006) examined the effect of cognitive style, specifically field independence and field dependence, on completing online visual-oriented tasks. The findings of this study support the study that students' initial knowledge has a statistically significant relationship. This finding also shows that field independence students can show higher knowledge-based learning outcome scores (Lee, 2006; Rufi'i, 2010; Liu & Ginther, 1999). Witkin (1978) found differences between field dependence and field independence when they were given ambiguous information and in an unstructured context. However, no differences were found when unambiguous situations with inherent structures were applied. The results show that field dependence can do the same thing with field independence when teaching materials are structured and structured properly.

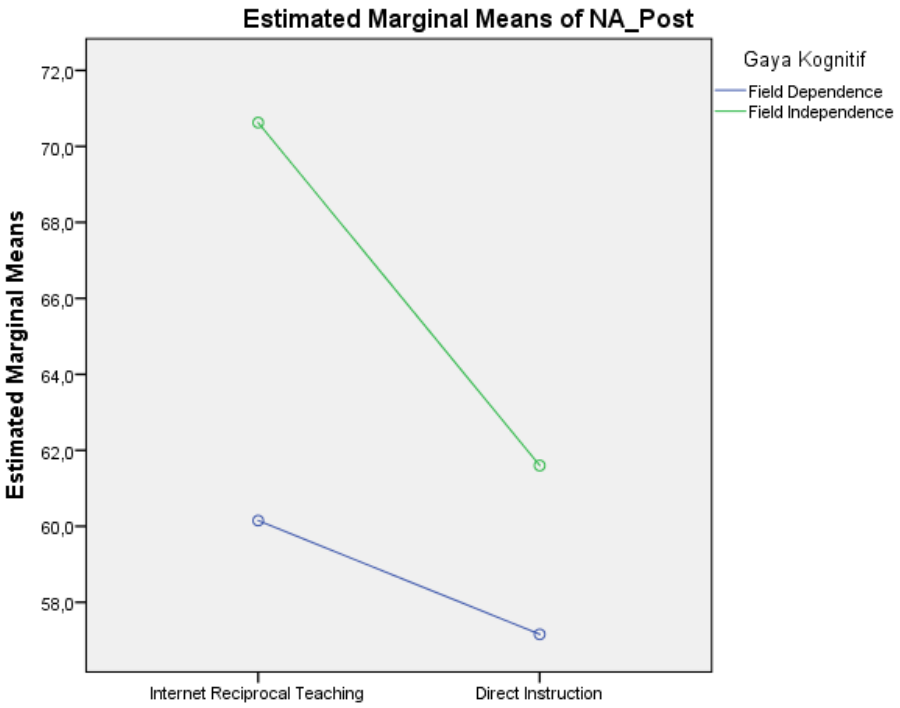

Figure: The pattern of interactions between learning strategies (Internet Reciprocal Teaching and Direct Instruction) and cognitive styles (Field Dependence and Field Independence)

Based on the picture above, the third finding shows there is no interaction between learning strategies and cognitive style in computer application courses. The insignificance of the interaction between learning strategies and cognitive styles can be interpreted as variable learning strategies not tied to the type of cognitive style. The field independence cognitive style has more tendencies above than the dependent field cognitive style, with the adoption of internet reciprocal teaching and direct instruction strategies. The independent variable and moderator variable conclude that there is no interaction. This confirms that the dominant influence on learning outcomes of students in this study is the learning strategy used, although in the same situation cognitive style also contributes to the achievement of learning outcomes when it is relevant to the learning strategies used. This is evidenced by the existence of significant differences in student learning outcomes between those who have a field dependent cognitive style and field independence.

Students with different types of cognitive styles need different learning strategies to match their information processing needs and students' needs. When the characteristics and limitations of cognitive styles affect learning effectiveness, variables become a significant factor in planning the structure and models of learning delivery, and the learning designer must consider them (Witkin & Goodenough, 1981). Liu & Reed (1994) conducted an experimental study that explored the relationship between cognitive style and learning strategies in a hypermedia-based language learning environment. They found that field dependent students showed different learning patterns from field independence students, in this study field dependent students watched more video clips to get a global view of overall learning, while field independence students paid more attention to the relationship of the

structure of learning material. They also found that field independence students felt comfortable manipulating material without worrying about confusion, while field dependent students tended to follow the order provided. The results of this study support the assumption that people with field dependence are holistic and need external assistance, while field independence people are realistic and have the ability to help them solve problems. Although there are slight differences in the use of support strategies such as assistance, maps, note taking, and training tools, the use of hypermedia in learning does provide learners to find learning strategies that fit the cognitive style.

Individual differences are believed to be an important concern in the design, development, and implementation of teaching materials and curriculum (Skinner, 1954). Each individual has the preferred way to obtain, arrange and process information. A fundamental problem for education and, in particular, for computer-based learning concerns the effects of individual differences on the effectiveness of teaching and learning, design and development of learning environments to maximize learners' strengths and minimize their weaknesses (Graff, 2003; Snow, 1997). Chinien & Boutin (1993) state that "field dependence / field independence, which is an important aspect of individual differences among students regarding how they obtain and process information, is also an important aspect for planning and developing effective teaching materials. wanting to design effective learning experiences through computers may need to be aware of the potential impact of cognitive styles on learning performance and consider how to accommodate individual differences in a comprehensive and integrated way.

The argument of the findings of this study is that students who have the field independence cognitive style are suitable for all learning strategies (internet reciprocal teaching and direct instruction). On the other hand, for students who have a field dependent cognitive style, their learning outcomes are better when using reciprocal teaching internet strategies than direct instruction strategies. Thus the use of internet reciprocal teaching strategies can improve learning outcomes for students who have a field dependent cognitive style and a field independence cognitive style. The results of Witkin's research (1978) show that field dependence can do the same thing with field independence when teaching materials are structured and structured properly. Difficulty in field dependence related to long-term memory can be overcome by providing organized and structured learning assistance, and the use of appropriate learning strategies (Davis, 1991). Reciprocal teaching internet learning in computer application courses allows all students who have both cognitive field dependent and field independence cognitive styles more time to practice, so the learning outcomes are better than direct instruction. This is supported by the research of Berger & Goldberger (1979) that by providing plenty of time and practice for field dependent students, the coding differences between field dependence and field independence can be accommodated. This is in line with the findings of McVerry, Zawilinski, & O'Byrne (2009) research. Internet reciprocal teaching has brought a number of benefits in teaching reading skills, online understanding and strategies related to new literacy, including increased creativity, communication, collaboration, critical thinking , and understanding. Instead the direct instruction strategy emphasizes the giving of concepts only from learners to learners so that students in the

learning process only as an audience only, do not play an active role in learning activities (Reigeluth & Beatty, 2017; Slavin, 2006).

Internet reciprocal teaching using the internet as a primary learning source in the learning process will add sources of information from various links on the internet. This is in line with the results of Ekayana's research (2015), namely the use of the internet as a source of learning for students and learners is already quite optimal in its use. The internet as a source of learning can be used to increase and add knowledge to be given to students. The benefits of the internet in supporting lectures are in the good category, meaning that students believe the more information they get, the more achievements they will get (Setiyani, 2010).

In internet reciprocal taching is given responsibility through three stages of online research implementation and understanding of learning aimed at increasing academic involvement, encouraging active reading and forming students as experts in online research (Castek & Coiro, 2010). This includes learning centered on learners or is learning that encourages independence in learning. Students are given the responsibility to gain learning experience through reading skills and collecting as much information from the internet. Reciprocal teaching internet strategies have brought a number of benefits in teaching online reading, understanding skills and strategies related to new literacy. Specifically, the benefits of internet reciprocal teaching increase creativity, communication, collaboration, critical thinking, and understanding (McVerry et al., 2009). This design can easily be adapted to meet curriculum objectives and general standards across disciplines and provide a strong framework for developing classroom learning that facilitates the ability to understand reading online.

IV. CONCLUSION

Based on the results of the study can be concluded as follows: (1) there are significant differences in student learning outcomes between those who get internet reciprocal teaching and direct instruction in computer application courses. Reciprocal teaching internet learning strategies are better than students given direct instruction learning strategies, (2) there are significant differences in student learning outcomes between those who have the field independence cognitive style and the field dependence on computer application courses. In this study students who have a field independence cognitive style have better learning outcomes compared with students who have a cognitive style dependent field, (3) there is no interaction between learning strategies and cognitive styles. In this study the learning strategy does not depend on the cognitive style possessed by students, because the learning strategy and cognitive style each have a strong influence so that the interaction of the two variables becomes weak.

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