

# The Effect of Learning Models and Critical Thinking Skills on Social Science Learning Outcomes

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**Abstract**— This study aimed to find out: (1) The comparison of social science learning outcomes of students who were taught by problem-based learning model and group investigation learning model; (2) The comparison of social science learning outcomes of students who had high critical thinking skills and who had low critical thinking skills; (3) The interaction between learning models and critical thinking skills on social science learning outcomes. The research method used was a quasi-experimental 2x2 factorial design. The results of this research concluded that: (1) the average of social science learning outcomes of students who were taught by the problem-based learning model was higher than the group investigation learning model; (2) the average of social science learning outcomes of students who had high critical thinking skills was higher than low critical thinking skills; (3) there was an interaction between learning models and critical thinking skills on social science learning outcomes

**Keywords;** *learning model, critical thinking skills, social science learning outcomes*

## I. INTRODUCTION

Learning model which had been applied in SMP Negeri 4 Medan especially in social science learning was a conventional learning model or known as teacher center learning. This learning run verbally and it was oriented solely to the mastery of the subject matter. This was reinforced by the results of a study conducted by Pongtuluran who stated that, education in our schools today was still a teacher-centered education (Instructor-Centered Learning). The main concentration in teaching and learning process was concentrated solely on teaching aspect. Self-guidance and training were almost nonexistent. It was not the teachers to be blamed, but the entire educational system. The existing national curriculum was too rigid and centralized. Too many subjects were taught in school in 37-42 hours per week, even a small innovation alone was unlikely to do. Teachers were

haunted by the national curriculum and syllabus that must be done on time. Concerning on the curriculum, although it was possible to adapt it in the local context, the allocated time was not enough even to implement the national curriculum itself. The way out which the teacher finally thought was "bookish", which meant that whatever was said in the national compulsory books should be considered true, without adapting to local situations contextually, without further interpretation of the teacher, no improvisation from the teachers and also the learners [7].

Based on these problems, the result of Dhewantoro's study concluded that the development of the quality of education would be achieved if the learning process was appropriate and useful for knowledge, attitude, and skills. One of the goals of social science was to include the basic ability to think critically. Therefore, students' critical thinking skills were needed in social science learning. Therefore, the application or selection of appropriate learning models should be done by teachers to improve student learning outcomes. To make social science learning to be interesting, it had to be started from the teacher [1]. As Wahab pointed out and quoted by Gunawan that any change done without commitment and hard work of the teachers would all be useless or fail entirely. Evidence suggested that many educational innovations had been made but failed or even abandoned in their implementation because the teachers lacked information and lacked professional teacher commitment [5].

In the study of research conducted by Hmelo mentioned that the problem-based learning model (problem-based learning) was considered appropriate for the achievement of social learning objectives. This was based on the idea that the problem-based learning model aimed to improve students' critical thinking skills, making the learner active because it put the learning into the real-world problems, and making students responsible for their learning [6]. Ennis said that this model was very well to be used to improve students' thinking

skills. Through this model, students would be motivated to investigate, develop, test and discuss the best alternative hypotheses and solutions [2].

As with PBL, TSOL research studies, et al suggested that cooperative learning Group Investigation (GI) was a learning model that corresponded to the constructivist paradigm. The group investigation learning model provided the widest opportunity to the students to be involved directly and actively in the learning process from planning up to how to learn a topic. Through the GI model, learners interacted with a lot of information while working collaboratively with others in cooperative situations to investigate problems, plan and make presentations, and also evaluate the results of their work. This model also required students to have good communication and group process skills. [13].

Seels and Richey argued that the characteristics of students were dependent on the background of the student's experience that influenced the effectiveness of the learning process. In classroom learning activities, with heterogeneous student characteristics in both small and large classes, then the teacher's planned strategy would be different, in the strategy of organizing the material, delivery and processing [12]. It was intended that the learning outcomes could take place effectively and efficiently and had an attraction for students. In this case, the characteristics of students are the ability to think critically in social science learning. According to Sapriya, that many thinking skills contributed to problem solving and participation in community life effectively [11].

Based on the above description, the researcher obtained the idea that student learning outcomes could be improved through appropriate learning model, which certainly would not be separated from the influence of characteristics owned by the students. On the basis of the findings and the results of research that had been done, researcher was interested to prove and review these problems more widely by doing this research.

This research problem could be formulated as follows: (1) was the learning social science outcome of students who were taught by the problem-based learning model higher than the students who were taught by the study group investigation model? (2) was the social science learning outcome of students with high critical thinking skills higher than those with low critical thinking skills? (3) was there any an interaction between learning models and critical thinking skills on social science learning outcomes?

## II REVIEW OF LITERATURE

Supardan (2015) explain that *sosialstudies* or IPS is learning program is have purpose to help trying educate, and then the student have competential and ca analysis one by one all of them as comprehensipagar

Joyce and Weil (1972) state learning model is a planning or a pattern use in lesson plan in class or learning tutorial to include with other book, film, computer, curriculum, and etc. Each learning model have aims learning achievement.

Fisher (2009) state though, critic is activities can doing well and critic thinker is standarts intellectual, example: explanation, relevention, koherency and etc

## III METHOD

This research was conducted in SMP Negeri 4 Medan. The population in this study was all students of class VIII SMP Negeri 4 Medan with the number of 403 students. The technique to take samples in this study was a randomized sampling technique (cluster random sampling).

This research used experimental method with quasi design of 2x2 factorial design experiments. Through this design, the influence of problem-based learning model and group investigation learning model were compared toward the social science learning outcomes in terms of students' critical thinking skills. These variables were further put into the research design as shown in Table 1.

TABLE I. RESEARCH DESIGN

A \ B	PBL (A <sub>1</sub> )	GI (A <sub>2</sub> )
High (B <sub>1</sub> )	A <sub>1</sub> B <sub>1</sub>	A <sub>2</sub> B <sub>1</sub>
Low (B <sub>2</sub> )	A <sub>1</sub> B <sub>2</sub>	A <sub>2</sub> B <sub>2</sub>

Description:

- A1B1: The learning outcomes of social science from the group of students who were treated with the problem-based learning model and who had high critical thinking skills
- A2B1: The learning outcomes of social science from groups of students who were treated with group investigation models and who had high critical thinking skills
- A1B2: The learning outcomes of social science from groups of students who were treated with problem-based learning strategies and who had low critical thinking skills
- A2B2: The learning outcomes of social science from groups of students who were treated with group investigation learning strategies and who had low critical thinking skills.

The techniques of data analysis used were descriptive and inferential statistical technique. Descriptive statistical technique was used to describe the data include: average value, median, mode, variance and standard deviation. The inferential technique to be used was the data analysis technique of variance (ANAVA) 2 x 2. Hypothesis testing would be performed at 5% significance level. Before the two-ways ANAVA were performed, the requirement analysis test was performed first by using normality test and Liliefors test and homogeneity test by using Fisher test and Bartlett test.

Furthermore, for hypothesis testing, the statistical hypothesis was formulated as follows:

- Hypothesis I  $H_0 : \mu A_1 \leq \mu A_2$   
 $H_a : \mu A_1 > \mu A_2$
- Hypothesis II  $H_0 : \mu B_1 \leq \mu B_2$   
 $H_a : \mu B_1 > \mu B_2$
- Hypothesis III  $H_0 : A \times B = 0$   
 $H_a : A \times B \neq 0$

## II. RESULT AND DISCUSSION

The first, second and third hypothesis testing was performed by using two-ways ANAVA. The summary of the calculation results could be seen in Table 2 below.

TABLE II . THE SUMMARY OF ANAVA TEST RESULT

Sources of variation	dk	JK	RJK	F <sub>h</sub>	F <sub>t</sub>
A	1	91,24	91,24	7,09	3,99
B	1	385,08	385,08	29,91	3,99
AB	1	57,65	57,65	4,49	3,99
Galat	66	849,8	12,87	-	-
Total	69	1383,7	-	-	-

Description:

A : Learning model

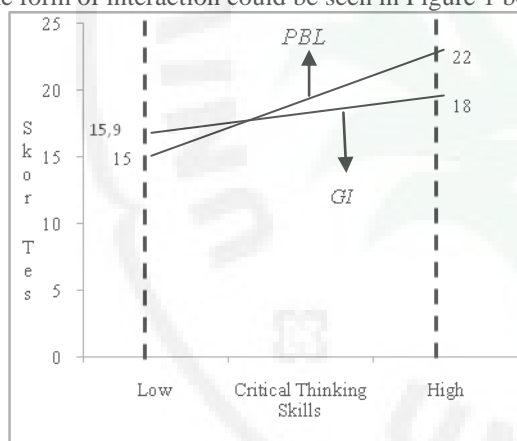
B : Critical Thinking Skills

Dk : Degree of freedom

JK : The sum of squares

RJK : The mean sum of squares

The form of interaction could be seen in Figure 1 below.



Interaction Between Learning Models and Critical Thinking Skills on Social Science Learning Outcomes

## III. FINDING AND DISCUSSION

### A. Finding

*First*, the result of social science learning of students who were taught by the problem-based learning model was higher than the students who were taught by the group investigation learning model.

*Second*, the social science learning outcomes of students with higher critical thinking skills were higher than those with low critical thinking skills.

*Third*, there was an interaction between learning models and critical thinking skills on social science learning outcomes. Students who had high critical thinking skills gained higher learning results of social science if they were taught by using problem-based learning model rather than using group investigation learning model, while students who

had low critical thinking skills gained higher learning results if they were taught by using group investigation learning model rather than using problem based learning model.

The results of the first hypothesis testing showed that the average learning outcomes of social science from the group of students who received treatment of problem-based learning model were higher than the group of students who received treatment of group investigation model. This was because students in the group of problem-based learning models were familiarized to analyze the problem, identify the core of the problem, formulate the hypothesis, identify what should be known and which must be studied to find the solution of the problem presented. Furthermore, students communicated the problem solving strategies that had been made to produce a complex and appropriate problem solving. Based on the level of thinking, these activities led the students from the level of understanding to the level of application, analysis, evaluation and create.

This is in line with Etherington who argued that the PBL process empowered the students and the educators to assume responsibility for directing learning, defining, analyzing problems, and building solutions [3]. In addition, according to Tan quoted by Rusman that the PBL model was an innovation in learning because in this learning model, students' thinking ability was optimized through a group process or a systematic team, so that students could empower, sharpen, test, and develop their thinking ability on an ongoing basis. The problem-based learning model stimulated active learning by asking students to summarize their own words from what they had learned and encouraged students to discover the relationship between the problems they had learned [10].

While in the group investigation learning model, students were preferred to select the topics or themes they wanted, and they would learn independently and seek the lessons to be interesting and satisfying in accordance with the agreement between teacher and student. In this model, students only investigated a topic in their group so that students' high-order thinking ability was not good enough. In the group investigation model, students investigated the problems they chose. Through the process of investigation, students found the process of solving the problem without making a hypothesis first.

if it was viewed from both learning models, group investigation was a model of learning based on the theme while problem based learning based on the problem. The theme-based learning was in all learning, the students had to be required to be independent and able to bring up a new theme that was easily mastered by students. Students tended to take the themes they encountered in everyday life that might not necessarily be a problem which required a solution. Meanwhile, compared with problem-based learning where all the problems were obtained from the teacher, so that it would require students to read, equate with real events and provide solutions to those problems.

The findings of this study were in accordance with the results of research conducted by Pujiasti et al, suggested that

there were differences in student learning outcomes by using problem based learning model with student learning outcomes by using cooperative group investigation learning model. The improvement in learning outcomes occurred in students by using problem-based learning model [8].

From the above description, it could be seen that the students' learning outcomes related to the cognitive aspect were very developed in the learning problem based learning model. Thus, it was clear that using a problem-based learning model would have a better impact on learning social science than using a group investigation learning model.

Testing of the second hypothesis showed that the mean value of social science learning outcomes of students with high critical thinking skills was higher than those with low critical thinking skills. This indicated that students with high critical thinking skills were better able to understand social science lessons than students with low critical thinking skills.

This study was reinforced by previous research conducted by Wulandari, et al concluded that there was a significant difference between the learning outcomes of the group of students who had high critical thinking compared to the group of students who had low critical thinking, the result showed that the average learning outcomes of high critical thinking students were higher than the average learning outcomes of low critical thinking students [14].

From the results of monitoring by researcher during the learning process, it appeared that students who belong to have high critical thinking skills tended to be more concentrated, more motivated and enthusiastic to follow learning, more confident in asking questions, answering questions, more daring to express their opinions as well as seek solutions to the problems given to them. Students who had high critical thinking skills were also not afraid of wrong or different opinions with other students and they also had mutual respect. While during the learning process, students who had low critical thinking skills tended to be less attention, less concentrated, less motivated in learning and less critical than students who had high critical thinking skills.

Based on the above description, it was clear that students who had high critical thinking skills got higher learning results of social science than those with low critical thinking skills.

Testing of the third hypothesis showed that there was an interaction between learning model and critical thinking skills to social science learning outcomes. The average of social science learning outcomes in the group of students who had high critical thinking skills and taught with the problem-based learning model was higher than the average of learning outcomes in the groups of students who had high critical thinking skills and taught by using the group investigation learning model. Furthermore, the average of social science learning outcomes in the group of students who had low critical thinking skills and taught with the problem-based learning model is lower than the average learning outcomes in the groups of students who had low critical thinking skills and taught by using learning group investigation model. This

indicated that the average value of the group of students who had high critical thinking skills and using the problem-based learning model was higher than using the group investigation learning model.

Critical thinking skills were part of high-level thinking skills that required students to develop a process of analyzing or evaluating information from a problem based on logical thinking to make decisions, and to produce something new and give new understanding to the existing concept. These capabilities could be enhanced through the application of learning model of problem-based learning. Problem-based learning model focused on selected issues so that the students not only learned the concepts related to the problem but also the scientific method to solve the problem. Therefore, this concept was not only relevant to the problem that had become the focus of learning but also the learning experience, skills of applying scientific methods in problem solving and cultivating critical thinking patterns.

This study reinforced the previous research conducted by Suati stated that critical thinking skills between students who were learning with problem-based learning model or PBL were higher than students who were learning with cooperative group Investigation model [12].

Based on this, it could be concluded that there was interaction of application of learning model and critical thinking skill of student to social science learning result. Selection of the right learning model became the main key in the success of the learning process. This study proved that the selection and application of good and appropriate learning model and supported by high critical thinking skills would produce good learning results so that learning objectives could be achieved as expected. Teaching and learning activities in the classroom became active and fun.

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