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THE EFFECT OF IMPLEMENTATION PROBLEM BASED LEARNING METHOD TOWARDS STUDENTS' CRITICAL THINKING SKILLS MODERATED BY SELF REGULATED LEARNING ON BASIC COMPETENCY ANALYZING INTERNATIONAL TRADE

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Abstract:-

This research was motivated by the low of students' critical thinking skills in SMA Negeri 1 Singaparna IPS class XI. The purpose of this study was to determine the difference in the effect between the problem-based learning methods with lecture methods towards the students' critical thinking skills, the difference in students' critical thinking skills using problembased learning method at the high, medium and low level of self-regulated learning, and how the interaction learning methods with self-regulated learning towards the students' critical thinking skills. The research method was a quasi-experimental study using 3x2 factorial design and object research throughout the entire class XI IPS consisting of 4 classes. IPS XI-2 class as a class experiment and IPS XI-1 class as a class Control. The study's instruments using self-regulated learning questionnaires and critical thinking skills test. Data analysis using inferential parametric two-way ANOVA SPSS 20. The results of data analysis showed that: 1) There are differences in students' critical thinking skills using problem-based learning and conventional method varied lecture, 2) There are differences in students' critical thinking skills using problem-based learning method at high, medium and low of self-regulated learning levels, and 3) There is interaction learning method with self-regulated learning.

Keywords: - *Problem Based Learning Method (PBL), Self-Regulated Learning (SRL), Crirical Thinking Skills*

1. INTRODUCTION

Students' Critical thinking skills in Indonesia, especially in West Java is still relatively low. It is based on the results of TIMSS 2015 which showed that the critical thinking skills of students in Indonesia is still low in position 44th from 56 countries. Futhermore, based on the results of PISA 2015 which showed that the critical thinking skills of students in Indonesia is still low in position 65th from 72 countries In theory, low ability students in critical thinking is because the learning process is still teacher centered and teachers tend to use conventional method in learning. Thus, students become passive and less involved in the learning process. It makes students dependent on teachers and students weak in critical thinking.

To solve this problem we needed one learning method that able made student become active in learning and critical thinker. One of learning method is Problem Based Learning. Constructively PBL model can make learner has high level thinking ability like critical thinking, problem solving ability, and creative thinking. Critical thinking is the reasonable and reflective thinking processes are used in mental activities such as analyzing problems, solving problems, making decisions and evaluating selected decisions (Dewey, J., 1916; Swartz, R. & Perkins, D., 1990; Bahriah E.P., 2011).

Problem based learning is a method of learning that involves students to solve problems through the stages of the method so that students can understand each other related issues, at the same time have the skills to solve problems and make students active in the learning process (Howard S. Barrows & Robyn M. Tamblyn, 1980; Kamdi, W dkk. 2007**)**.

Creating active learning economics should start from the students who have the independence to learn to prepare and everything needed in the learning process. Self-Regulated Learning is an active constructive process whereby learners set learning goals, then try to organize, and control the aspects of self-regulated learning (cognition, motivation, and behavior) (Wolters, C. A., Pintrich, P. R., & Karabenick, S. A., 2005).

Problem based learning method moderated by self-regulated learning have a positive impact, students can organize their lesson, and improve their critical thinking ability (Wolters, C. A., Pintrich, P. R., & Karabenick, S. A., 2005; Anindyta, P., & Suwarjo, S., 2014).

Problem Based Learning method phase according to Arends (2007) consists of provide an orient for students to the problem to the learners, organize students to learn, guiding independent and group investigations, develop and present the work, analyze and evaluate the problem-solving process. Indicator of self-regulated learning according Zamnah (2012) that measured in this research were learning initiative, diagnose the learning needs, setting learning goals, monitor, organize and control learning, viewing difficulties as a challenge, utilize and search for relevant sources, selecting and setting appropriate learning strategies, evaluate the learning process and outcomes, self-concept. Indicator of critical thinking skills according Ennis (1987) consists of clarity, basic, inference, interaction.

The different of this research between the earlier researches is to find the interaction of learning method (problem based learning and conventional method varied lecture) with self-regulated learning toward students' economics critical thinking skills. The formulation of the research problem is (1) Is there a difference in effect between problem based learning method and lecture method varies to students' economics critical thinking skills, (2) Is there a difference in students' economics critical thinking skills using problem based learning method at high, medium and low of self-regulated learning levels, (3) Is there an interaction of learning method with self-regulated learning on critical thinking skills.

2. Method

This research is a quasi-experiment aimed to see the effect of problem based learning method moderated by self-regulated on critical thinking skills. The population in this research was all student of Class XI program of IPS concentration in SMA Negeri 1 Singaparna 20172018 school year that consist of four classes.

Sample in this research were two classes using purposive sampling type judgment sampling, IPS XI-1 class as a class control taught by conventional method varied lecture and IPS XI-2 class as a class experiment taught by problem based learning method. IPS XI-1 class consist of 36 students and IPS XI-2 class consist of 35 students. This research using 3x2 factorial design. Data analysis using inferential parametric two-way ANOVA SPSS 20.

The independent variables there are two kinds of problem based learning nethod (experimental group) and conventional learning (control group). The dependent variable is the critical thinking skills. The moderator variable is self-regulated learning. Indicator student's economics critical thinking skills consist of four aspects namely: clarity, basic, inference, interaction. Indicator self-regulated learning consist of nine aspects namely : learning initiative, diagnose the learning needs, setting learning goals, monitor, organize and control learning, viewing difficulties as a challenge, utilize and search for relevant sources, selecting and setting appropriate learning strategies, evaluate the learning process and outcomes, selfconcept.

Data collection techniques in this study were obtained through a critical thinking skills tests and questionnaires self-regulated learning. The instruments had been validated and fulfilled the requirements of validity and reliability of test. Data collection will be conducted in two stages, collect data about student self-regulated learning and collect data about student's economics critical thinking skills. The design of research using 3x2 factorial design were given on Table 1.

Table 1. Design of Factorial

Factor (B)		Learning Method (A)	
		Problem based learning Class (A1)	Conventional method varied lecture class (A2)
Self-regulated learning	High (B1)	A1B1	A2B1
	Medium (B2)	A1B2	A2B2
	Low (B3)	A1B3	A2B3

Explanation:
A = Treatment using learning method
A1 = Problem based learning method
A2 = Conventional method varied lecture
B = Factorial
B1 = Self-regulated learning high level
B2 = Self-regulated learning medium level
B3 = Self-regulated learning low level
Y = Critical thinking skills

3. Result

Student's critical thinking on the conventional method varied lecture class and problem based learning class show on following table.

Table 2. Pre-test and Post-test critical thinking skills

	Critical thinking skills	
	conventional method varied lecture class	problem based learning class
Pre test	46,42	40,11
Post test	65,74	75,47

Base on Table 2, description of the average value of pretest and posttest critical thinking skills on the problem based learning class and conventional method varied lecture class as follows: For each class pretest conventional method varied lecture and problem based learning are 46, 42 and 40, 11, For each class post-test conventional method varied lecture and problem based learning are are 65, 74 and 75, 47. The results of learning method moderated by self-regulated on critical thinking skills show on following Table 3.

Table 3. Description of Interaction Variable Statistics

Interaction (Learning method*Self-regulated learning level)	**Mean score of critical thinking**
Conventional method varied lecture*Low	58,83
Conventional method varied lecture*Medium	63,74
Conventional method varied lecture*High	73,70
Problem based learning*Low	75,00
Problem based learning*Medium	75,29
Problem based learning*High	76,43

Table 3 shows mean sccore of critical thinking skills from interaction beetwen learning method and self-regulated learning level.

Hypothesis testing

Before testing the hypothesis first tested the prerequisite that normality test, homogeneity, and test results normal distribution and homogeneous data. After the prerequisite test is done, and then followed with two ways ANOVA with SPSS 20.

Table 4 Tests of Between-Subjects Effects

Dependent Variable: CRITICAL_THINKING_SKILLS					
Source	ype III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2684,259[a]	5	536,852	13,162	,000
Intercept	254213,247	1	254213,247	6232,385	,000
LEARNING_METHOD	1317,387	1	1317,387	32,298	,000
SELF_REGULATED_LEARNING	523,950	2	261,975	6,423	,003
LEARNING_METHOD* SELF_REGULATED_LEARNING	346,415	2	173,207	4,246	,018
Error	2651,290	65	40,789		
Total	359988,000	71			
Corrected Total	5335,549	70			

a. R Squared =, 503 (Adjusted R Squared =, 465)

Table 5. Post Hoc Test

Dependent Variable: CRITICAL_THINKING_SKILLS Tukey HSD

(I) INTERACTION	(J) INTERACTION	Mean Differe nce (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
CONVENTIONAL_METHOD_VARIED_LECTURE*SRL_LOW	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_MEDIUM	-4,90	2,991	,576	-13,69	3,88
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_HIGH	-14,87*	3,298	,000	-24,55	-5,18
	PROBLEM_BASED_LEARNING*SRL_LOW	-16,17*	3,867	,001	-27,52	-4,81
	PROBLEM_BASED_LEARNING*SRL_MEDIUM	-16,46*	2,915	,000	-25,02	-7,90
	PROBLEM_BASED_LEARNING*SRL_HIGH	-17,60*	3,553	,000	-28,03	-7,16
CONVENTIONAL_METHOD_VARIED_LECTURE*SRL_MEDIUM	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_LOW	4,90	2,991	,576	-3,88	13,69
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_HIGH	-9,96*	2,495	,002	-17,29	-2,64
	PROBLEM_BASED_LEARNING*SRL_LOW	-11,26*	3,210	,010	-20,69	-1,84
	PROBLEM_BASED_LEARNING*SRL_MEDIUM	-11,55*	1,961	,000	-17,31	-5,80
	PROBLEM_BASED_LEARNING*SRL_HIGH	-12,69*	2,824	,000	-20,98	-4,40
CONVENTIONAL_METHOD_VARIED_LECTURE*SRL_HIGH	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_LOW	14,87*	3,298	,000	5,18	24,55
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_MEDIUM	9,96*	2,495	,002	2,64	17,29
	PROBLEM_BASED_LEARNING*SRL_LOW	-1,30	3,498	,999	-11,57	8,97
	PROBLEM_BASED_LEARNING*SRL_MEDIUM	-1,59	2,404	,985	-8,65	5,47
	PROBLEM_BASED_LEARNING*SRL_HIGH	-2,73	3,147	,953	-11,97	6,51
PROBLEM_BASED_LEARNING*SRL_LOW	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_LOW	16,17*	3,867	,001	4,81	27,52
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_MEDIUM	11,26*	3,210	,010	1,84	20,69
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_HIGH	1,30	3,498	,999	-8,97	11,57
	PROBLEM_BASED_LEARNING*SRL_MEDIUM	-,29	3,140	1,000	-9,51	8,93
	PROBLEM_BASED_LEARNING*SRL_HIGH	-1,43	3,740	,999	-12,41	9,55
PROBLEM_BASED_LEARNING*SRL_MEDIUM	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_LOW	16,46*	2,915	,000	7,90	25,02
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_MEDIUM	11,55*	1,961	,000	5,80	17,31
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_HIGH	1,59	2,404	,985	-5,47	8,65
	PROBLEM_BASED_LEARNING*SRL_LOW	,29	3,140	1,000	-8,93	9,51
	PROBLEM_BASED_LEARNING*SRL_HIGH	-1,14	2,743	,998	-9,19	6,92
PROBLEM_BASED_LEARNING*SRL_HIGH	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_LOW	17,60*	3,553	,000	7,16	28,03
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_MEDIUM	12,69*	2,824	,000	4,40	20,98
	CONVENTIONAL_METHOD_VARIED_LECTURE* SRL_HIGH	2,73	3,147	,953	-6,51	11,97
	PROBLEM_BASED_LEARNING*SRL_LOW	1,43	3,740	,999	-9,55	12,41
	PROBLEM_BASED_LEARNING*SRL_MEDIUM	1,14	2,743	,998	-6,92	9,19

Based on observed means.

The error term is Mean Square (Error) = 40,789.

*. The mean difference is significant at the, 05 level.

Based on Table 4, the results of the data analyze are as follows: (1) There are differences in students' critical thinking skills using problem-based learning and conventional method varied lecture, critical thinking skills of students that learned using problem based learning method is better than the conventional method varied lecture (sig 0,000 < 0,05), (2) There are differences in students' critical thinking skills using problem-based learning method at high, medium and low of self-regulated learning levels (sig 0,003 < 0,05), and (3) There is interaction learning method with self-regulated learning (sig 0,018 < 0,05).

In analyzing the difference between the groups then used the analyze of Post Hoc Test. The results presented in Table. Base on Table 5 test results Post Hoc test then obtained some comparisons interaction between groups as follows:

1) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level is less than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at high level with significant 0,000> 0.05

2) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level is less than The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at low level with significant 0,001> 0.05

3) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level is less than The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at medium level with significant 0,000> 0.05

4) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level is less than The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at high level with significant 0,000> 0.05

5) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level is less than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at high level with significant 0,002> 0.05

6) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level is less than The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at low level with significant 0,010> 0.05

7) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level is less than The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at medium level with significant 0,000> 0.05

8) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level is less than The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at high level with significant 0,000> 0.05

9) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at high level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level with significant 0,000> 0.05

10) The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at high level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level with significant 0,002> 0.05

11) The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at low level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level with significant 0,001> 0.05

12) The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at low level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level with significant 0,010> 0.05

13) The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at medium level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level with significant 0,000> 0.05

14) The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at medium level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level with significant 0,000> 0.05

15) The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at high level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at low level with significant 0,000> 0.05

16) The critical thinking on Problem Based Learning for groups of students with Self-Regulated Learning at high level is higher than The critical thinking on Conventional Method Varied Lecture for groups of students with Self-Regulated Learning at medium level with significant 0,000> 0.05

For more clearly in view as the interaction will be shown in Figure 1.

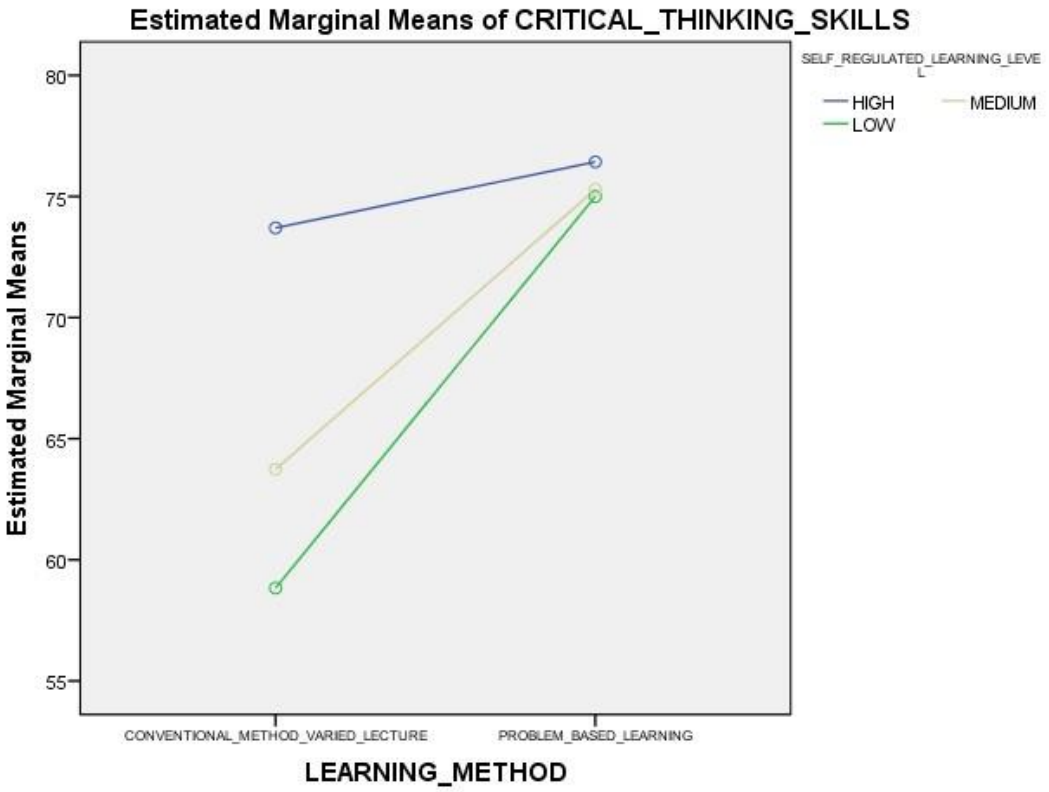

Figure 1. Interaction Learning method and Self-Regulated Learning toward Critical thinking skills

The graph shows that the critical thinking skills on Problem Based Learning for groups of students with self-regulated learning level have critical thinking average better than the student's critical thinking skills on Conventional Method Varied Lecture.

On Conventional class, student's economics critical thinking with self-regulated learning at low, and medium have level critical thinking average lower than all. Student's economics critical thinking with self-regulated learning at high level have average better than student's economics critical thinking with self-regulated learning at low, and medium. But, student's economics critical thinking with self-regulated learning at high level have average lower than Problem based learning on self-regulated learning at low, medium, and high level.

The graph shows that Problem based learning with Self regulated learning at low, medium, and high level positive influence in increasing the student's economics critical thinking.

4. Discussion

4.1 The Effect of Learning Methods on Critical Thinking Skills

Based on average value and hypothesis test shown that there are differences in students' critical thinking skills using problem-based learning and conventional method varied lecture. Student's economics critical thinking using Problem based learning method was better than using Conventional method. The result of this research resemblance also found in previous studies. Martyn (2014) showed the results that problem-based learning improves students' critical thinking skills in their research. Results show that treatment with problem-based learning provides an additional 23% of the difference in critical thinking skills scores. And also research Anindyta, P., & Suwarjo, S. (2014) showed the results that there are significant differences in students' critical thinking skills between classes taught using problem based learning and classes taught using conventional method, with sig values. 0.040. The average value of critical thinking skills using problem based learning was better than the average value of critical thinking skills using conventional method.

Crtical thinking skill increased in problem based learning method because students play an active role in the learning process that requires students to think critically, be able to solve the problem (Howard S. Barrows & Robyn M. Tamblyn, 1980; Wood, D. F., 2003; Ullynuha, L., Baskoro Adi, P., & Ariyanto, J., 2015).

PBL have a problem to train students in developing higher level thinking abilities of students. This problem is used to relate a sense of curiosity as well as the ability to analyze learners and initiatives on the subject matter (Amir, M. Taufik, 2010). Problem based learning motivates students to be problem-oriented, students are responsible and active in learning and most of the learning takes place in the context of small groups and students wherever possible finds solutions to problems (Hallinger, P., & Lu, J., 2011). Thus, problem based learning facilitates students to think critically and make students become critical thinkers...

In the conventional learning, students tend to be passive in class, information is only one way, feedback is relatively low, less attached to the memories of students, monotone and not develop students' critical thinking (Hisyam Zaini, dkk., 2008).

4.2 The Effect of Self-Regulated Learning on Critical Thinking Skills

Base on hypothesis testing that student's critical thinking in group of students with Self-regulated learning at high level have high average value of crititical thinking skills.

This is due to students who have high self-regulated learning can manage themselves in preparing themselves for learning, maintaining motivation, setting goals, monitoring progress, and and control the aspects of self-regulated learning (cognition, motivation, and behavior) (Zimmerman, B. J., 1989; Wolters, C. A., Pintrich, P. R., & Karabenick, S. A., 2005; Magno, C., 2009).

Students who have low self-regulated learning tend to be less diligent and persistent in solving a problem, when they find difficulty in solving problems they are desperate and quickly give up and have low learning activity (Fidiana, L., Bambang, S., & Pratiwi, D., 2012)

4.3 There is interaction learning method with self-regulated learning

Based on hypothesis testing there was interaction between Problem based learning and Conventional Method Varied Lecture moderated by Self-Regulated Learning for increasing the student's economics critical thinking. Influence Self-regulated learning to student's economics critical thinking on Problem based learning class higher than on Conventional Method Varied Lecture class.

The interaction between problem-based learning methods moderated by self-regulated learning can increase student's interest and enthusiasm so that students' critical thinking increases.

Self-Regulated Learning contributes positively to the critical thinking skills of students in the form of self-evaluation. Self-evaluation trains students to establish a decision of what has been evaluated. Previous research also supports that Self-Regulated Learning is correlated with critical thinking skills performed by Ghadampour, E., Kamkar, P., Garavand, H., & Jamshidikia, S. (2014).

On Problem based learning class, students with Self-regulated learning groups at high level their critical thinking skills are better than students with Self-regulated learning groups at low, and medium level. On conventional class, students with Self-regulated learning groups at high level their critical thinking skills are better than students with Self-regulated learning groups at low, and medium level. This is due to Students who have high self-regulated learning, are more effective in learning and easier in solving problems in a shorter period of time than people who do not have Self-Regulated Learning (Zimmerman, B.J., 2000).

5. Conclusion

Student's economics critical thinking skills using Problem based learning is better than using conventional learning. These results showed that there is effect of problem based learning method and conventional method varied lecture to student's economics critical thinking.

Students' economics critical thinking in problem based learning method have differences at high, medium and low of self-regulated learning level. Students with Self-regulated learning groups at high level their critical thinking skills are better than students with Self-regulated learning groups at low, and medium level. These results showed there is effect self-regulated learning toward student's economics critical thinking skills.

There is an interaction between learning method and Self-regulated learning in enhancing students' economics critical thinking skills. In this research that on Problem based learning class, Self-regulated learning gave high effect on student's economics critical thinking skills.

6. Suggestion

PBL will be more effective in improving the student's economics critical thinking if supported by economics problem related to everyday life to solve economics problems, as well as presenting problems of economics that requires students to solve the problem. Learning method of Problem Based Learning give optimum result in increasing the critical thinking students if it applied on condition that the student has high Self-regulated learning.

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