

## **The Effect of Group Investigation Method Towards Critical Thinking Ability with Students' Self Study Moderator Variable**

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**Abstract:** The aim of this study is to find out the effect of learning method, students' self study and how the interaction of such two variables toward students' critical thinking skills in economy subject in class X at SMAN 11 Bandung. The study method is quasi experiment by using factorial design 2×3 with participants are all students of class X IIS which consists of 5 classes. Instruments which are used are critical thinking test and self study questionnaire. Data analysis use two-way ANOVA, so study result is obtained that learning method has significant effect towards students' critical thinking ability, then students' self study has significant effect toward students' critical thinking ability and critical thinking ability which has category of self study by using group investigation method show high category of self study whereas critical thinking ability which has self study category by using varied lectures method show medium and low category of self study.

**Key words:** Investigation group method, self study, critical thinking skill kritis, category, Indonesia

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### **INTRODUCTION**

The result of Program of International Student Assessment (PISA), in 2012 which is themed "Evaluating School Systems to Improve Education" showed that the ability of Indonesian children at age 15 years old is in 64 position from 65 countries, at mathematics subject with average score is 375, average science score is 382 and average reading score is 396, if it is compared with other countries such as Singapore, Indonesia is still lagged behind and Vietnam which just revive and build their country also is still low and Indonesia position is slightly better than Peru which is in the bottom of the survey. Then, based on pre-study result at SMA Negeri 11 Bandung, in January 2016, the problem which is occurred is the lack of critical thinking skill, so to find out the level of students' critical thinking skill, the researcher give 10 essay items which involves all students of class X (IIS 1-4) by using cognitive indicator from Anderson and Krathwol taxonomy at high cognitive level, namely, C4 (analyzing) and C5 (evaluating) which synthesizing by using stages from critical thinking indicator form Robert Ennis. The result is average score 60 and 80 has not achieved KKM which has been enacted in economy subject which means that students' critical thinking ability in SMAN 11 Bandung is still low, besides, it is found that in the field, teacher in the learning process still uses

conventional method, namely, various lectures and the lack of using learning tools which can support students more active in teaching and learning activity, whereas, the school has such facility. Based on finding which is obtained, so, it is needed critical thinking skill ability in economy learning process because learning economic learning requires ability in building students' knowledge in high level thinking. According to Banazak and Brennan (1983), the importance of learning economics because economy is knowledge for all people which involves crucial decision in all aspect of life, cost determination and the benefit in the daily life, based on such background, so, the problem formulation in this study are:

- Is there any effect of investigation group method with varied lectures method towards critical thinking skill?
- Is there any effect of students' self study (high, medium, low) towards students' critical thinking skill?
- Is there interaction of learning method towards students' critical thinking skill?

#### **Underlying theory**

**Critical thinking ability:** Critical thinking ability does not only require mind because mind cannot guarantee that a person can think critically where critical thinking emands how a person uses his/her mind or instinct in

criticizing or questioning something according to Robert Ennis, defining critical thinking is a logical and reflective thinking which focuses on deciding what must be believed or done. The importance of high level thinking in learning process can train students to manage their thinking reflectively in deciding and in finding out an answer from their point of view.

Critical thinking indicator which is revealed by Edward Glaser in Fisher, categorized important indicators in critical thinking: identifying problem, determining ways which can be used in solving problems, collecting and arranging information which is required) identifying assumptions and values which are stated, understanding and using language clearly, properly and exclusively, analyzing data, valuing fact and evaluating statements, identifying logical relationship among problems, drawing conclusion from similarities which are required, testing similarities and conclusions which is taken by someone, rearranging confidence patterns based on experience and making assessment towards certain things and qualities in the daily life. The importance of high critical thinking in learning process is critical thinking can train students to manage their thinking reflectively, in finding out or finding the answer from their point of view.

**Group investigation method:** In line with the discussion above, theory which underlies the paradigm shift of the lack of critical thinking ability in learning process is constructivism theory, from John Dewey learning, according to Huda, Dewey learning emphasizes on active thinking process, interacting with each other and the feedback of "learning by doing". Investigation group method in students' learning process can build cognitive thinking pattern in obtaining learning experience, by looking for information from various sources, whether sources inside school or sources outside school, sources can be obtained from (books, institution, internet, etc.) which later on students are able to evaluate and synthesize information which is contributed by each group, so, they can produce a work group. According to Cohen and Slavin, group investigation is cooperative learning which emphasizes on the use of project which oriented on finding, building aspect towards all ability which are possessed by students, students who have special ability in one area can help the success of the group.

Also, steps that must be paid attention in using investigation group method according to Zingaro (2008), there are 6 steps, namely) teacher proposes multi-faceted problems towards class and students have group interest. Problems which are emerged here is very important as various actions from students are required for proper group formation. Teacher must avoid their own ideas or reject students' ideas) group plans their own

investigation-procedure, task or purpose consistently with sub topic which has been selected) group conduct investigation as planned by steps above. Teacher's role in this step is following investigation process, offering assistance which is required: shows sources, determining various skills which are used, etc.) group plans their own presentation. They evaluate what they have learnt and synthesize formats that can be understood by class) group conduct such presentation) teacher and students evaluate investigation and presentation. During such process, the group representatives often makes report towards class, helping group members and respect that they are part of bigger social unit.

**Concept of students' self study:** Self study is one of personality aspect which emerge when students find position which demands a level of confidence, self study potency in learning process can push or give motivation towards students that learning is not only refers to score achievement, but also willingness, skill and process which direct students to understand towards something that is learned or the meaningfulness of learning. Desmita, stated that self study is someone's ability in fulfilling the desire to compete to move forward, ability in taking decision, initiative in solving problem has self confidence and responsible towards what he/she has done. Self study in learning process is required and needs to be developed in sharpening students' competence, so, they will more calm when facing problem in doing or completing learning tasks or has self confidence, responsibility and discipline to achieve such learning goal. According to Illahi (2012), indicators in self study includes) learning initiative) diagnosing students' need, determining target or learning goals, controlling learning, using and looking for relevant source, selecting and determining learning strategies, evaluating process and study result.

**Hypothesis of study:** Based on theoretical review and thinking framework above, the hypothesis which can be proposed in this study as follows:

- There is effect of investigation group method with varied lectures method towards critical thinking skill
- There is effect of students' self study (high, medium and low) towards critical thinking skill
- There is interaction of investigation group method towards critical thinking skill

## **MATERIALS AND METHODS**

Method which is used in this study is quasi experiment by using factorial design 2×3, the study variable, x<sub>1</sub>: independent variable is investigation group

method as treatment,  $x_2$ : self study (high, medium, low) is independent variable as factor,  $y$ : the ability of critical thinking as dependent variable, this study analysis uses two way ANOVA (two factor model) parametric inferential statistic which aims to test Mean effect, the effect of independent variable towards dependent variable and testing interaction joint effect of two independent variable towards dependent variable, then the testing criteria is if sig value or probability value  $<0.05$  so, hypothesis which is proposed  $H_A$  is accepted and  $H_0$  is rejected, if sig value or probability value  $>0.05$  so, research hypothesis  $H_A$  and  $H_0$  is accepted.

Population which is used in this study is all students of class X IIS at SMA Negeri 11 which consists of 5 classes in 2015/2016 academic year which consists of 205 students, technique of sample collection is based on existing subject group. So, sample which is used in this study is collected randomly, namely, class X IIS1 as experimental class and class X IIS2 as control class. Instrument which is used is test to find out students' critical thinking and questionnaire to assess students' self study which categorized as (high, medium and low).

### RESULTS AND DISCUSSION

Based on hypothesis which is proposed, study result is obtained as follows:

- Variable of learning method which is obtained is F value = 7.449 and  $p = 0.008 < 0.05$ , it means that the first hypothesis is accepted, namely, there is effect of investigation group learning method and varied lectures towards students' critical thinking in economy subject
- Self study variable which is obtained is F value = 7.507 and  $p = 0.001 < 0.05$ , it means that second hypothesis is accepted, namely, there is effect of self study (high, medium, low) towards students' critical thinking in economy subject
- Interaction variable which is obtained is F value = 24.896 and  $p = 0.000 < 0.05$ , it means the third hypothesis is accepted, namely, variable of students' critical thinking ability in economy subject is significantly influenced by interaction of learning method with students' self study

Below is the interaction of learning method with students' self study in relation with variability of critical thinking ability (Fig. 1).

Based on hypothesis result which has been tested in general, answering theory which is proposed in this study, that in learning process, method role as one of the way in enhancing critical thinking skill in economy subject

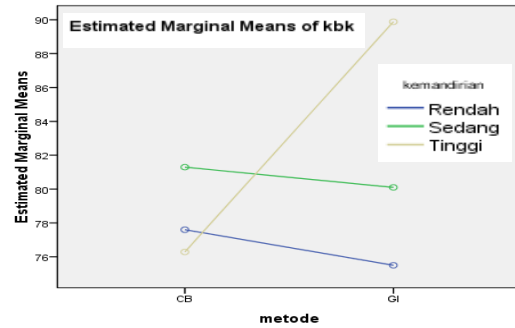


Fig. 1: Profil plot estimated means of critical thinking skill

can be seen from students' self study. In line with constructivism learning theory, John Dewey according to Huda, Dewey learning emphasizes on active thinking process, interacting with each other and there is feedback "learning by doing". Thus, learning emerge from a concept that students will be easier in finding and building high thinking skill if they discuss with their friends, so, social reality and the use of peer group can be one of the main aspect in cooperative learning. In implementing investigation group method in field, it can be formed by considering intimacy or similar interest towards a topic which is presented, in which students is presented with a case with sub material which will be discussed.

Then, there is effect of students' self study which is categorized as high, medium and low which has significant effect towards critical thinking skill, it can be justified with theory from Desmita that someone's self study in fulfilling desire to move ahead, ability in taking decision, initiative in solving problem has self confidence and responsible towards what he/she has done. So, someone who has already able in developing critical thinking ability in learning process can influence self study because can be said independent if they are able to think critically which also accompanied by awareness and intelligence in comparing problem that is occurring and what will occur, so, they can draw conclusion and ideas that can be used to solve such problems. Every person has their own thinking pattern. Nevertheless, if every person can think critically, problems which are faced can be felt simple and easy to be solved.

Critical thinking skill which has self study category by using investigation group method shows high category of self study, meanwhile critical thinking skill which has self study category by using varied lectures method has medium and low category of self study.

### **CONCLUSION**

There is effect of learning method towards students' critical thinking on economy subject at class X at SMAN 11 Bandung. There is effect of students' self study with critical thinking skill towards economy subject at class X at SMAN 11 Bandung.

There is interaction of critical thinking with method which is used on students' self study towards economy subject at class X at SMAN 11 Bandung. Investigation group method give effect to students' critical thinking ability with average of self study is high,

meanwhile varied lectures method give effect to students' critical thinking with medium and low self study.

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