Effect of Cooperative Learning Model of Team Assisted Individualization On Critical Thinking Ability

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Abstract : *The purpose of this research was to identify the effect of cooperative learning model of team assisted individualization (TAI) and direct learning on critical thinking ability in chemical education. The method of this research is quasi experiment with design pretest-posttest non-equivalent control group design. The sample of this research was class XI IPA 3 as experiment group and class XI IPA 2 as control group, which choosen by purposive sampling technic. The proposed hypotheses of the research were tested by using analysis of covarian. The results of the research showed that $F_{count} < F_{table}$ (0.281 < 3.996) then H_0 is accepted, no significant influence on students' critical thinking ability which is taught using cooperative learning model of TAI is different from students who are taught using conventional learning model with average ability value critical thinking of the students in the experimental class 7.10 and in the control class 7.69.*

Keywords: *cooperative learning model of Team Assisted Individualization, Critical thinking ability*

I.   Introduction

Education is a program that involves a number of components that work together in a process to achieve programmed objectives [9]. Education is very important in the development of one's personality and mindset to be able to face the challenges of the future. Educational challenges of the 21st century including the critical thinking and problem-solving skills and communication and collaboration skills [1].The latest development of Indonesian government education is by enacting the curriculum 2013. The development of the curriculum 2013 that conforms to the competency standards of graduates who have targeted learning includes the development of the attitudes, knowledge, and skills aspects elaborated for each educational unit [6]. One of the competencies to be developed in the development of the curriculum 2013 that includes critical thinking and problem solving; creativity and innovation; communication and collaboration. In line with this, one of the objectives of chemistry subjects is to foster a scientific attitude that includes the ability to think logically and critically, honestly, openly, objectively, resilient and can cooperate with others [6]. Chemistry as one of the lessons taught at the secondary school level that studies the material, which includes the composition, properties, and changes as well as the energy changes that accompany the material changes. Students in the most of high school, chemistry is considered a difficult subject because chemistry is closely related to abstract ideas or concepts that require scientific reasoning. Students need to have a high understanding to be able to understand the subject matter of chemistry in order to improve student learning outcomes. One effort that can be used to make students interested to learn chemistry and invite students fully involved in learning activities is to apply cooperative learning model team assisted individualization (TAI).The cooperative learning model of team assisted individualization (TAI) is a group learning method with a student who is better able to act as an assistant in charge of individually assisting other underprivileged students in the group. The role of educators only as facilitators and mediators in the learning process. Educators are enough to seek the condition of a conducive learning environment for learners [5]. Cooperative learning TAI is a learning that handles students to solve problems given by teachers in small groups. This way of learning requires students to participate actively in the classroom, on the other hand, students are also taught to accept differences that may arise in groups [16]. The use of cooperative learning type TAI is expected to increase students' enthusiasm in communicating their oral and written understanding that can be seen in students' ability in question and answer session in class discussion and students' ability in expressing their understanding in writing in the form of notes [7].Chemical learning in addition to requiring appropriate methods in understanding the material that tends to abstract also requires the development of critical thinking ability are very important. The ability to think critically provides the right direction in thinking and working, and helps in determining the relevance of something with others more accurately. The development of students' critical thinking ability should be developed as early as possible, both at elementary and high school levels [11].Critical thinking is the ability and active interpretation and

evaluation of the results of observation and communication, information and argumentation. Critical thinking is a persistent effort to test something that is believed in truth or knowledge with supporting evidence so that further conclusions can be drawn [4]. Critical thinking is an intellectually disciplined process that actively and skillfully conceptualizes, implements, analyzes, synthesizes, and / or evaluates information gathered from, or generated fro, observations, experiences, reflections, reasoning, or communication, as a guide to beliefs and actions [12].The purose of this research is to try a cooperative learning model of team assisted individualization (TAI) in order to produce learning that can grow students 'critical thinking ability and improve students' chemistry learning result on hydrocarbon subjects. Based on the description above, while the purpose of this study to determine the effect of application of cooperative learning model of team assisted individualization and conventional learning model on critical thinking ability.

II. Research Methods

This research was conducted in SMA Negeri 1 Pringgarata in 2017/2018. Type of this research is a quasi experiment. The design according to this research is nonequivalent control group pratest-posttest design [2].This design consists of two classes, namely experimental class and control class. The sample consists of two classes selected by purposive sampling technique. The sample selection is based on a specific purpose, which is based on the average pre-test result. The instruments used in this research are learning tools in the form of learning implementation plan (RPP) and student activity sheet (LKS). The instrument test used to measure students' critical thinking ability consisting of the pretest instrument amounted to 4 description and posttest instrument amounting to 5 description questions. The hypothetical test of students' critical thinking ability was tested using ANACOVA.

III. Result and Discussion

The first paragraph under each heading or subheading should be flush left, and subsequent paragraphs should have a five-space indentation. A colon is inserted before an equation is presented, but there is no punctuation following the equation. All equations are numbered and referred to in the text solely by a number enclosed in a round bracket (i.e., (3) reads as "equation 3"). Ensure that any miscellaneous numbering system you use in your paper cannot be confused with a reference [4] or an equation (3) designation. (10)This study aims to determine the effect of the application of cooperative learning model of team assisted individualisation and conventional learning model on critical thinking ability on hydrocarbon material in class XI Science SMAN 1 Pringgarata year of learning 2017/2018.

Table 1. The average value of students' critical thinking ability

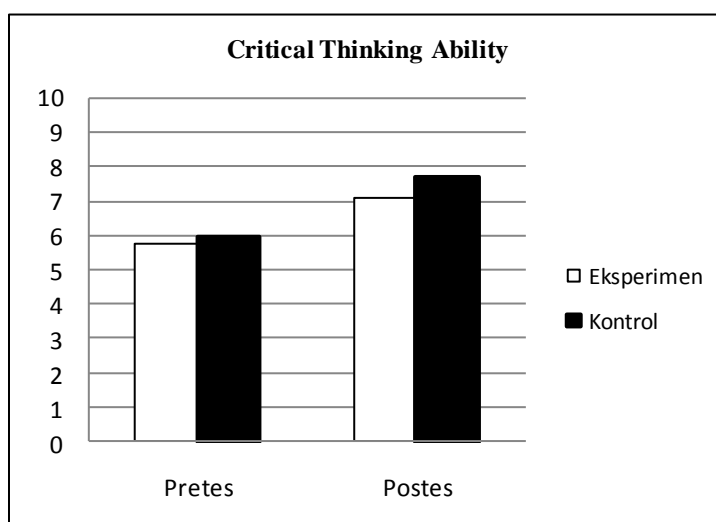| Kelas	average value on critical thinking ability	
	Pretest	Posttets
Experimen	5.77	7.10
Control	5.97	7.69

Fig. 1: average value on critical thinking ability

Table 2. The results of hypothesis testing students' critical thinking ability with covariance analysis

	F_{count}	F_{table}	Ket.
Critical Thinking Ability	0.218	3.996	H_0 Accepted $F_{count} < F_{table}$

Based on table 1, the average pretest of critical thinking ability of the experimental class is lower than the control class. While the posttest average of critical thinking ability of the experimental class is also lower than the control class. But both classes experienced a significant increase. Based on table 2, Ancova test results on critical thinking ability showed that the value at F_{count} 0.218 <3.996 F_{table}, it can be concluded there is no influence of the application of cooperative learning model type team assisted individualization and conventional learning model of critical thinking ability. The average already describes a class superior to its critical thinking ability. This is because students in the control class are better at understanding learning than the experimental class. So the cooperative learning model TAI has no effect on students' critical thinking ability but there are significant differences between the two classes. This is in line with research conducted by Qurniati [10] which states that there is no influence of learning discovery learning model of students' critical thinking ability. The observed from the pretest and posttest values, both classes experienced a significant increase. As shown in table 1, the mean value of the experimental class at pretest is 5.77 and the posttest value is 7.10. This indicates an increase in students' critical thinking ability in the experimental class by 19%. In the control class the average value of critical pretest thinking ability is 5.97 and at posttest 7.69. This indicates an increase in students' critical thinking ability in the control class by 22%. So both classes have an increased ability to think critically. The results of this study are in line with Sulistyani [14] which states students' mathematical critical thinking ability increases after being taught by problem-based learning combined with TAI's coopertative learning model. Meanwhile, according to Firda [3] application of Team Assisted Individualization learning model combined Problem Based Learning along with portfolio arrangement can improve students' critical thinking ability by 23,4% The results described above show that control classes are better in their critical thinking ability than in the experimental class because based on observations at the time of the research the students in the control class have good learning abilities and students prefer direct teaching or conventional learning. The reason for the experimental class is no better than the control class because the success of the learning process requires the skills in the group to communicate the information and ideas in mind. While in practice every member of the group is less able to communicate well. It seems that what Thobroni and Mustofa [15] revealed to some students, especially students who have more ability or diligence, group learning will be detrimental to them, where they feel their less clever or lazy companions will ride their hard work. This often occurs when it does research and cause unsuccessful from this cooperative learning model TAI. In line with that Shoimin [13] mentions the lack of cooperative model of TAI one of which is hampering the way of thinking of students who have more ability to students who less. That is, students can not develop critical thinking ability because students who have more ability should be able to adapt to students who do not understand so that the friend can understand well. While students who are less dependent on students who have more ability so that the ability of critical thinking students who have weak ability does not develop well because following the decisions of students who have more ability. While the success of the control class is better than the experimental class because the giving of materials to the control class using conventional or direct instruction is taught step by step in detail and the provision of direct exercise on hydrocarbon material. In the learning process students in the control class are given feedback to the material and teachers emphasize more important points on the material being taught. Other things that affect the cooperative learning model of TAI have no effect on the critical thinking ability is caused by several other factors, such as external and internal factors in the learning process that can not be controlled by researchers and not measured in research conducted Maximizing the influence of TAI's cooperative model on students' critical thinking ability requires better combination or better treatment in controlling the learning and assertiveness of researchers in learning. Also maximized in preparing devices that can improve and develop students 'critical thinking ability, and familiarize students to be able to group and develop students' skills in critical thinking.

IV. Conclusion

Based on the results of research and discussion it can be concluded as follows there is no influence on the application of cooperative learning model of team assisted individualization type and conventional learning model to critical thinking ability. The average critical thinking ability of the experimental class is no better than the control class. With the average value of experimental class 7.10 and the control class 7.69.

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