ATLANTIS PRESS
Advances in Economics, Business and Management Research, volume 65
1st International Conference on Economics, Business, Entrepreneurship, and Finance (ICEBEF 2018)

Effect of Application Cooperative Learning Model Student Team Achievement Divisions Method of Improving Students Critical Thinking Ability

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***Abstract*—This research is about the influence of the use of Cooperative Learning model through Student Team Achievement Divisions (STAD) method towards the improvement of students' critical thinking. The problem in this research is the low of students' critical thinking about the subject of economics class eleven IPS program in one of the high schools in Sukabumi City The research method used is quasi experiment with research design The Non-Equivalent Pre-test - Post-Test Control Group Design. Based on the normality test, homogenies, and t-test from the pretest posttest data understanding of the learners' concept of the experimental class and the control class. The use of a cooperative learning model of STAD method is expected to improve students' critical thinking about economic subjects, especially on the subject of national income.**

Keywords—cooperative learning model; student critical thinking; learning STAD method

I. INTRODUCTION

At present, the world is entering an era of technology-based education and more advanced methods compared to the previous era. This must constantly be supported by various capacities, competencies and intellectual skills such as cooperative skills and consistently critical thinking, which must be possessed by students [1]. The era is now known as the era of knowledge-based economics, which requires a new pedagogical paradigm [2] and requires the quality of educated humans [3]. The educational paradigm changes from the teacher centered learning to student-centered learning [4]. Learning needs to be designed in the form of active learning, collaboration, self-regulated environments, and self-directed learning [5].

The ability needed to be a successful human being is the ability to (a) think critically, analyze and solve complex real-world problems, (b) find, evaluate, and use appropriate learning resources, (c) work together in teams and small groups, (d) effective oral and written communication skills and (e) using content knowledge and intellectual skills to become continuous learners [6]. Furthermore, Duch stated that some skills that must be possessed in the knowledge era are (a) critical-thinking skills and hard work, (b) creativity, (c) collaboration, (d) cross-cultural understanding, (e) communication, (f) computation, and (g) career and independence [7]. As stated by Sanjaya that current learning seems that students are less encouraged to develop thinking skills, students are directed to memorize information and are forced to remember, and to accumulate a variety of information without being required to understand the information they remember to connect with everyday life [8].

Experts point out the various notions of critical thinking. Critical thinking is one component in a high-level thinking process, using basic analysis of arguments and insights into each meaning and interpretation to develop cohesive and logical reasoning [9]. That critical-thinking is an active and systemic and reasonable effort, considering various points of view to understand and evaluate an information about the aim of determining whether the information is accepted, rejected or suspended [10-12]. Critical-thinking is the awareness of self-reflection (self-reflection), and ability (basic skills) and willingness (willingness to ask) to clarify and enhance understanding that helps in drawing the right conclusions and making the best decisions in a knowledge-based context [13]. Cognitive skills that are at the core of critical-thinking skills include; interpretation (analysis), analysis (analysis), evaluation (evaluation), inference (inference), explanation (explanation), and self-regulation [12,14,15].

Students are seen as unique and distinctive individuals from one another who had different abilities such as academic ability and thinking ability. There are students who have high, medium and low abilities [16,17]. In addition, students can be classified into smart, middle, and stupid categories [18]. The difference in hypothetical ability is very important to be considered in learning [19]. The gap between students with upper and lower abilities must be considered and expected that the gap will be minimized both in the process, and the result of learning and combined learning affect the success of student learning [20,21], found that academic ability influences students' critical-thinking skills, and the results of research on combine learning strategies influence critical-thinking skills. The learning strategies support the development of critical-thinking skills [22,23].

One of the determinants of learning success is determined by the approach, strategy, model, and method or learning

techniques used by the teacher. To determine the model or method of learning that is suitable for accounting materials require knowledge and understanding of the teacher both on the material, situation, conditions, and especially the learning model to be used. STAD type Cooperative Learning Model (Student Teams-Achievement Divisions) / Team Achievement Group students).

According to Anita Lie in her book "Cooperative Learning," that the Cooperative Learning model is not the same as just group learning, but there are basic elements that distinguish it from group division, which is done carelessly. Roger and David Johnson said that not all group work can be considered as Cooperative Learning, for that five elements of the mutual learning model must be applied, namely: Positive interdependence, individual responsibility, in person, communication between members, group process evaluation. While the application of this model is supported by the STAD type, where students achieve or understand heterogeneous groups other students so that they are expected to succeed in learning. The STAD type learning strategy has a prominent character, as an illustration. The intensity of collaboration between students in groups is high.

II. Students Critical Thinking Ability and Learning through STAD Method

A. Definition of Critical Thinking Ability

According to Dewey critical thinking is a functioning, persistent (and continuous) consideration of a belief or form of knowledge that is taken for granted in terms of the reasons that support it, and the continued conclusions become the tendency [24].

Based on Dewey's opinion, it can be interpreted that critical-thinking is functioning to think carried out continuously and analyze the knowledge they can by using the reasons and knowledge that support it. Meanwhile, according to Moon [25], "Critical thinking is to challenge an idea. It is being engaged in thinking about evaluative ways by considering the different perspectives and potential values to reach a modern level of knowledge and adding unused questions, finding answers and asking more questions. Critical-thinking is the process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information from or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action [26,27].

According to Glaser defines critical thinking as [24]:

- A willingness to think deeply about the problems and things that are within the reach of one's experience
- Knowledge of audit methods and logical reasoning, and
- A kind of skill to apply these methods. Critical-thinking demands a lot of effort to examine every belief and knowledge of assumptions based on the supporting evidence and the subsequent conclusions that result from it.

From the above explanation, it can be said that critical thinking is reflective thinking by using ideas in analyzing, synthesizing, and evaluating to increase knowledge by questioning, finding answers, and questioning based on information obtained from various sources logically and the experience they have.

B. Indicators of Critical-Thinking Ability

There are five domains of expertise with various indicators regarding critical thinking namely interpretation, analysis, evaluation, conclusion and explanation [28-31].

People who think critically are someone who can recognize problems, analyze and evaluate arguments with reason and reflective ways of thinking so that they can take decisions to solve problems or learn new concepts. So it can be said that critical-thinking indicator that is analyzing and evaluating [15,32,33].

C. Cooperative Learning

The National Education Law Number 20 of 2003 states that learning is the process of interaction between students and educators and learning resources in a learning environment. In learning, the teacher must understand the nature of the subject matter he taught and understand various learning models that can stimulate students' ability to learning by planning a mature teaching by the teacher.

Cooperative Learning is a learning model that supports contextual learning. The type of combined learning can be defined as a structured type of work / study group. Included in this structure are five basic elements [32,34–36], namely positive interdependence, individual responsibility, personal interaction, expertise in collaboration, and group processes.

The philosophy underlying Cooperative Learning (learning cooperation) in education is "homo hominis associus" which emphasizes that humans are social beings. Cooperative Learning is a teaching and learning strategy that emphasizes shared attitudes or behaviors in work or helps among others the structure of regular cooperation in groups, consisting of two or more people. Combined learning is based on constructivist theory. Combined learning arises from the concept that students will find it easier to find and understand difficult concepts if they discuss with their friends. Students routinely work in groups to help each other solve complex problems. So the social nature and the use of peer groups are the main aspects of cooperative learning [37-40].

According to Anita Lie in her book "Cooperative Learning," that the Cooperative Learning model is not the same as just group learning, but there are basic elements that distinguish it from group division, which is done carelessly, that not all group work could be considered combined learning [1]. Five important elements in combined learning, namely:

- Positive interdependence between students.
- Increased interaction between students.
- Individual responsibility.
- Interpersonal skills and small groups.

- Group process [41–43].

From the description of this cooperative learning review, it can be concluded that conjunctive learning requires collaboration between students and interdependence in the structure of task achievement, goals, and rewards. The success of this learning depends for the success of everyone within the group, where success is very meaningful to achieve a positive goal in group learning. By utilizing that fact, learning in groups cooperatively, students are trained and familiarized to share knowledge, experience, tasks, responsibilities. Help each other and practice communication-communication-socialization because cooperative is a miniature of community life, and learning to realize the shortcomings and advantages of each.

The five important elements contain in the cooperative learning model. They also contain principles that differentiate them from other learning models. The main concept of cooperative learning [44], as follows:

- Group awards, which will be given if the group reaches the specified criteria.
- Characteristic responsibility, meaning that group success depends on distinctive learning of all group members. This responsibility focuses on efforts to help others and ensure each group member is ready to face evaluation without the help of others.
- The same opportunity for success means that students have helped the group by increasing their own learning. This ensures that high, medium, and low-ability students are equally challenged to do their best and that the contribution from all group members is very valuable.
- The main steps or stages in the lessons that use cooperative learning are described [36,45,46].

So the cooperative learning model is learning activities by grouping with each other to work in conjunction to help construct concepts, solve problems, or inquiry. According to theory and experience so that a cohesive (compact-participatory) group, each group member consists of 4-5 people, diverse students (ability, gender, character), control and facilitation, and asking for group resulted from the form of reports or presentations. The syntax of cooperative learning is information, strategy-direction, forming varying groups, group work, group outcome presentations, and reporting.

D. *Student Teams-Achievement Divisions (STAD)*

STAD type cooperative learning is one type of learning model by using small groups as the number of members within each group of 4 - 5 students in a heterogeneous, states that the STAD students are placed a learning team consisting of 4 - 5 people who are mixed by achievement level, gender and tribe. The teacher presents lessons, and after that students, working on their team ensures that all team members have mastered the lesson. Afterwards, the students are given a test over the material, at the time of this test student are not allowed to help each other, the process of STAD types cooperative learning model through five stages, namely

- Stage of presentation of material.
- Stage of group activities.
- Individual test phase.
- Stage of individual development score calculation [47,48].

III. Research Methodology

In accordance with the type of research design used, the design in this study is The Non-Equivalent Pre-test - Post-Test Control Group Design. Where this design there are two groups of experimental groups and control groups. This research is grouped into three stages, namely preparation phase, implementation stage, and reporting stage. The research procedure to be carried out is three stages:

A. *Preparation stage*

- This stage starts from the proposal submission which is then selected by the committee.
- Develop learning plans, questions and research instruments.
- Choosing schools and classes that will be used as experimental class and control class
- Testing instruments outside of the study sample, analyzed and revised.

B. *Implementation Phase*

- Provides a pretest of students' critical thinking skills in the experimental class as well as in the control class.
- Implement learning process STAD type Cooperative Learning in experimental class and ordinary learning (lecture) in control class.
- Provide posttest of critical thinking instruments of students in the experimental class as well as the control class.

C. *Reporting phase*

- Analysis of data processing,
- Conclusion of research results,
- Create a research report.

IV. Findings and Discussion

Critical-thinking ability of experiment class students based on data analysis of pretest-posts results showed that there are differences of students' critical-thinking ability between before and after treatment using Cooperative Learning model through STAD method by giving the conclusion of improvement is categorized being. Results from this study are in accordance with that done by other researchers such as [49]. Cooperative Learning Methods: A Meta-Analysis Methods Of Cooperative Learning: What Can We Prove Works [50,51]. Motivation for Collaborative Discovery Learning Online and Its Application

in an Information Systems Assurance Course, Application of STAD Cooperative Learning Model (Student Teams Achievement Division) to Improve Student Learning Outcomes in Science Learning Light Material [52], applying Effects of Student Teams-Achievement Divisions Strategy and Mathematics Knowledge on Learning Outcomes in Chemical Kinetics [53]. The above research supports and strengthens research conducted by researchers using a model of Cooperative Learning through the STAD method can improve students' critical-thinking skills in economic learning.

In general, this study supports and strengthens Vygotsky's constructivism theory. According to Vygotsky, students have two levels of potential development. The level of actual development defines the level of an individual's current academic development and the ability to study specific things or the individual's own efforts. Individuals also have a level of potential development defined as the level of notional development that individuals can reach without the help of others such as teachers, parents, or more mature friends. The zone between the actual level of development and the level of student's promising development by Adesoji is called zone of Proximal Development, where learning occurs through the social interaction between students and teachers with peers [53]. With appropriate challenges and assistance from teachers or peers who are better able students move forward into their nearest development zone where new learning takes place.

Critical-thinking ability increased with the medium category, increasing this thinking as an influence from the Cooperative Learning models through the STAD method used in the empirical class. Increase of critical-thinking ability in the experimental class is caused by the STAD learning method of the students in the learning position occupies a very dominant position, the cooperation, the mutual help, and the individual responsibility within the group, where in each learning group is placed one student who has more abilities in economic learning so that everyone / student in the group tries to understand what is taught and is responsible for each member. Cooperative learning model with STAD method of each teacher learning using question and answer method, training and assignment method, even quiz method by each student will answer by applause where if the answer corrected to add distinctive and group points to achieve the best group criteria, so that in the process of student accounting learning will not be easily saturated and bored, notwithstanding students become interested subject of economical lessons because learning is done in addition to relevant learning objectives is also fun. In other words, learning using a model will increase student learning motivation [54].

Based on the results the implementation of PBM, and observes, it can be concluded that the model Cooperative Learning STAD method can affect the improvement of students' critical-thinking skills with a moderate increase in category. Because this learning model in addition to group learning is also in groups placed students with achievement of elements of beneficial interdependence, distinctive responsibility in groups, exchanging opinions, guiding each other if there are friends the group which had difficulty. This is consistent with the elements contained in the Model Cooperative Learning which are favorable interdependence, characteristic responsibility, personal interaction, teamwork skills, and group processes, so that it can improve students' ability in translation, interpretation, and extrapolation [41–43]. To support this ability, the educator must be abilities to integrate the learning model with the subject matter where the able to manage a good learning model can deliver the material deliver so that students have high translation, interpretation, and extra plastic skills, especially with basic competence to understand the national income.

V. Conclusion and Suggestions

After researchers conducted research and experiments the field, explained some findings, carried out data processing and analysis, then the researchers discussed the results from their research. In the end making a conclusion, the conclusion is a summary of the answers before the research questions described in the previous chapter. The conclusion throughout this study is that there are differences in accounting critical-thinking skills in the experimental class students who use the Cooperative Learning Model Type Student Teams Achievement Division (STAD) at the initial measurement (pretest) and at the final measurement (posttest). The difference can be seen in the average value the ability of students' critical-thinking skills between before and after treatment in the experimental class which is seen in the pretest and posttest scores produced by students and proven by hypothesis testing, students of students in mastering the material of economic material properly or maximally.

The teacher must understand the STAD Cooperative Learning Model stages correctly in the learning process in order further improve students' critical-thinking skills. The learning process using the STAD Cooperative Learning Model requires a lot of time, and the teacher must pay attention to the Learning Implementation Plan so that learning occurs efficiently and effective for achieving predetermined learning goals. Other researchers which use the STAD Cooperative Learning Model in conducting their research must pay attention to other aspects such as affective aspects and psychomotor aspects so that the results of research are better and perfect. The results this study cannot be generalized / not applicable to all subjects, all cognitive aspects, all levels of school, and educators, because of differences in objects and time of research.

Acknowledgment

In this paper, I would like to thank Ari Riswanto, who gave me many instructions and suggestions from my writing paper, and helped me complete this paper. I would like to thank the DPRM Ministry of Research and Higher Education Technology for giving this research funding and deep blessing to all of you.

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