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Efforts to Increase Curiosity Through Cooperative Lectures Type Student Teams Achievement Division (STAD) with Guided Discovery Approach in Economics Mathematics Course

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Abstract

The objectives of this study include: (1) To determine the implementation of cooperative lectures of the Student Teams Achievement Division (STAD) type with a guided discovery approach in the economic mathematics course of students of the D3 Accounting Study Program, Pamulang University, (2) To determine the results of the improvement curiosity in the application of cooperative lectures of the Student Teams Achievement Division (STAD) type with a guided discovery approach in the mathematical economics course of students of the D3 Accounting Study Program, Pamulang University, and (3) To find out the obstacles faced by lecturers and students as well as the efforts made in the application of cooperative lectures of the Student Teams Achievement Division (STAD) type with a guided discovery approach in economic mathematics courses for students of the D3 Accounting Study Program, Pamulang University. Research on efforts to increase curiosity through STAD type cooperative learning with a guided discovery approach in economics mathematics courses is a type of Classroom Action Research. This Classroom Action Research is intended to overcome a problem or improve a learning in the classroom. Therefore, the purpose of this research is to change the initial situation or condition to the expected condition (improvement oriented). Based on the results of research and discussion, it is concluded that learning mathematics using the STAD type cooperative model with a guided discovery approach can increase the curiosity of D3 Accounting students at Pamulang University. Learning mathematics using the STAD type cooperative model with a guided discovery approach at the D3 Accounting at Pamulang University has been carried out according to the procedure. The implementation of mathematics learning using the STAD type cooperative model with a guided discovery approach has been carried out following the steps that have been set.

Keywords : Guided Discovery, Curiosity, STAD

INTRODUCTION

The D3 Accounting Study Program at Pamulang University is an educational institution that teaches economic mathematics courses as one of the compulsory subjects for students. There are several problems - problems that arise related to economic mathematics lectures in the D3 Accounting Study Program at Pamulang University, this can be seen from the results of observations, lecturer interviews and initial condition questionnaire data conducted by researchers in semester 1 students of the D3 Accounting Study Program at Pamulang University.

Based on the initial findings of the researchers when making initial observations of the process of economic mathematics lectures, it can be seen that students are less enthusiastic about learning mathematics because students feel that mathematics is a difficult subject. This is evident when students work on practice questions given by lecturers, students need a long time to complete these questions and even some students are still not focused and not ready to work on it so the lecturer needs to reprimand him to remind students. Some participants have not been actively involved physically, mentally, or emotionally in the lecture process. In addition, it appears that some students passively listen to the lecturer's explanation. Even though he seems to be paying attention, the student has not shown activity, for example asking questions that show deeper curiosity, expressing answers and opinions about the things being studied, or some things that show his curiosity about the subject matter. Only certain students are active in the lecture process. On the other hand, there are students who are lazy and some students who talk to friends about things outside of class continuously even though the lecturer has warned them.

Ideally students have a curiosity in every lecture activity. But high curiosity is not shared by most students of the D3 Accounting Study Program at Pamulang University. Based on the results of a student curiosity questionnaire in economics mathematics lectures, results were obtained in the very high category of 9%, the high category of 21%, the medium category of 47%, the low category of 18% and the very low category of 6%. The average student curiosity questionnaire is 94 in the medium category. So that lecturers must make efforts so that the average results of student curiosity questionnaires in mathematics lectures are in the high category. If students have a high curiosity then it will have a positive influence on student achievement.

After the observation, interviews and initial condition questionnaire analysis were completed, researchers and lecturers held discussions about the lecture process that had just been completed to obtain further information about the problems that occurred. Based on the lecturer's analysis, the inability of students to understand the subject matter is due to their lack of ability to understand concepts. This is also exacerbated by the passivity of students in the lecture process and the lack of seriousness in learning. If these problems are allowed to continue, it is feared that they will cause student achievement to remain low and affect grades in the following semester. This needs to get serious attention considering that learning achievement is also used in determining grade increases. Lecturers need to seek ways so that students can master the competencies needed.

There are several lecture models that are seen as effective in enabling students to construct their knowledge, one of which is the use of cooperative lectures. Through cooperative lectures, students learn together in groups in mastering and solving problems. One type of cooperative learning model is the Student Teams Achievement Division (STAD) type. The STAD type lecture model allows students to be actively involved in lectures, develop their knowledge, attitudes and skills independently.

RESEARCH METHODS

Research on efforts to increase curiosity through cooperative learning type STAD with a guided discovery approach in economics mathematics courses is a type of Classroom Action Research. This Classroom Action Research is intended to overcome a problem or improve a lesson in the classroom. Therefore, the purpose of this research is to change the initial situation or condition towards the expected condition (improvement oriented).

The stages of this classroom action research include planning (plan), implementation (act), observation (observe), and reflection (reflect). In line with the nature of classroom action research which emphasizes the collaborative dimension, this research was carried out in collaboration between researchers and lecturers of economics mathematics at each stage. So the learning steps are as follows.

Table 1. Learning steps

STAD	Guided Discovery
Fase 1 : Class Presentations	*Stimulation* *Problem Statemen*
Fase 2 : Teams	*Data Collection* *Data Processing* *Verification* *Generalitation*
Fase 3 : Test or quiz	
Fase 4 : Score increase in the individual	
Fase 5: Award grup	

RESULT AND DISCUSSION

Based on the Pamulang University academic calendar, the lecture process runs from 28 February 2022 to 16 July 2022. This class action research was carried out from 14 to 30 March 2022. This research was carried out in two cycles, with three meetings in each cycle according to the mathematics lecture schedule economy.

A description of classroom action research on learning mathematics through the STAD learning model with a guided discovery approach in the first cycle is presented as follows:

1. Description of Cycle I Research Results

   Cycle I consisted of 3 meetings, with each meeting having a time allocation of 2 x 50 minutes. In cycle I, the actions taken are as follows:

   a. Cycle I Action Planning

      This activity aims to plan and prepare everything before conducting research. The activities carried out during planning include:

      1) Preparation of Learning Devices

         a) Semester Learning Plan (RPS)

            RPP was made by researchers with the consideration of lecturers and students, arranged so that learning is in accordance with the characteristics of the STAD learning model with a guided discovery approach that is focused on increasing student achievement and curiosity. The material taught at meetings 3 and 4 is the understanding of linear functions, supply functions, demand functions and market balance.

         b) Student Activity Sheet (LKM)

            LKM is a learning medium that facilitates students to be able to find concepts in linear function material in accordance with the expected competency achievement indicators. This LKM was compiled by researchers with the consideration of lecturers and lecturers. MFIs are structured using a guided discovery approach. LKM cycle I with material on linear functions, supply

functions, and demand functions. While MFI cycle II with market balance material.

c) Quiz

Quizzes are one of the activities in learning with the STAD type cooperative model. Before learning the lecturer prepares a quiz by compiling a grid. Next, the lecturer arranges quiz questions based on the grid. Quizzes will be held at the end of each meeting to measure the level of student understanding of the material being taught.

2) Preparation of Research Instruments

a) Test

This test is used to measure student achievement in the material being studied. The tests given are pretest and posttest. The pre-test was carried out before learning the STAD model with a guided discovery approach and the post-test was carried out at the end of the cycle. The preparation of pretest and posttest questions begins with compiling test grids. Then arrange the stem, answer key and distractor.

b) Learning Implementation Observation Sheet

This observation sheet is used to determine the implementation of the STAD type cooperative learning model with a guided discovery approach in accordance with the lesson plans that have been made.

3) Formation of Study Groups

The formation of study groups was carried out before the learning cycle I and cycle II began. This group was made heterogeneous in terms of pretest results and gender. This class is divided into 4 groups. Each group consists of four or five students.

b. Implementation and Observation of Cycle I Actions

At this stage the lecturer carries out the actions in accordance with the RPS that has been prepared by the researcher. During the research, the researcher was assisted by an observer who understood the STAD type of cooperative learning model with a guided discovery approach and had read the observation sheet of the implementation of learning. During learning activities, observers are participatory and participate in accompanying students in group study. Cycle I was carried out in three meetings, with each meeting lasting 2 x 50 minutes.

c. Data on Test Results and Observations

1) Test Result Data and Curiosity Questionnaire

The test is given at the end of the cycle to determine student achievement after learning is carried out using the STAD type cooperative model with a guided discovery approach. The test questions consist of 20 multiple choice questions. In this test students are said to be complete if the scores obtained by students reach the Minimum Completeness Criteria (KKM) set by the school, which is 7.5. The percentage of cycle I test results is presented in Table 2 as follows.

Table 7. Percentage of Completeness of Cycle I Test Results

Criteria	Amount	Percent of Average
Complete	12	67%
Not Completed	6	33%
Amount	18	100%

Based on the test results, there were 14 students who had completed their studies and 16 other students who had not completed their studies. The percentage of students who complete is 67%. Here it can be seen that the number of students who have completed their studies has not reached 75% of all students. So it needs to be repaired in the next cycle.

2) Observation Data on the Implementation of Learning
Based on the results of observations made during 2 meetings in cycle I by an observer, the implementation of learning using the STAD type cooperative model with a guided discovery approach has been carried out properly according to the criteria used. The results of cycle II observations are presented in the Appendix. While in detail the percentage of implementation is presented in Table 3. below:

Table 3. Percentage of Implementation of Learning using the model STAD

Meeting	Percentage		Average
	Lecturer	Student	
Meeting 1	82 %	82 %	82 %
Meeting 2	89 %	89 %	89 %
Percentage of implementation of cycle I learning			86 %

At the first meeting the percentage of learning implementation was 82%. At this meeting the activities that were not carried out included students responding to group presentations, especially groups that received questions from groups presenting in front of the class, the lecturer made a summary related to the presentation or discussion activities that had been carried out by students, the lecturer checked the level of student understanding by asking questions brief related material to students, and all students finished doing all the practice questions at the LKM.

At the second meeting the percentage of learning implementation was 89%. At this meeting the activities that were not carried out included the lecturer arousing student motivation by conveying the benefits of the material to be studied, the lecturer checking the level of student understanding by giving short questions related to the material to students, and all students finished working on all the practice questions at the LKM.

3) Reflection on Cycle I

Reflection in cycle I focused on the problems that arose during the action. The researcher together with the lecturer discussed to carry out an assessment during the process that occurred and then made improvements. The course of the research was not in accordance with the planned procedures because there were several problems that arose during the learning activities.

After discussing with the lecturer, the researcher made improvements in learning in cycle II, including:

1) Lecturers pay more attention so that discussions in groups run optimally by always monitoring and going around the class when group discussions take place.
2) If students ask the lecturer, the lecturer does not immediately answer student questions but gives instructions as necessary so that students can independently answer the questions they ask.

3) Lecturers monitor students carefully so that the time allotted for students to work on practice questions is not used by students for other things outside of class. In addition, if the practice questions are not completed, students are asked to continue at home with notes that at the next meeting, assignments are collected and briefly discussed at the beginning of the meeting.
4) Lecturers plan the distribution of time for each learning activity so that it is more effective and that no learning steps are missed.
5) The lecturer emphasizes more on students to be more serious in learning and at the meeting before the test is held, and the lecturer gives additional questions to students as practice at home.

d. Data on Test Results, Observations, and Interviews

1) Test Result Data

The test is given at the end of the cycle to determine student achievement after learning is carried out using the STAD type cooperative model with a guided discovery approach. The test questions consist of 20 multiple choice questions. In this test students are said to be complete if the scores obtained by students reach the Minimum Completeness Criteria (KKM) set by the school, which is 7.5. The percentage of cycle I test results is presented in Table 4 as follows:

Table 4. Percentage of Completeness of Cycle II Test Results

Kriteria	Jumlah	Persen rata-rata
Tuntas	16	89%
Tidak Tuntas	2	11%
Jumlah	18	100%

Based on the test results, there were 16 students who had completed their studies and 2 other students who had not completed their studies. The percentage of students who complete is 89%. Here it can be seen that the number of students who have completed their studies has exceeded 11% of all students. So that it can be said to have achieved the expected target.

2) Observation Data on the Implementation of Learning

Based on the results of observations made during 2 meetings in cycle II by an observer, the implementation of learning using the STAD type cooperative model with a guided discovery approach has been carried out properly according to the criteria used. While in detail the percentage of implementation is presented in Table 5 below:

Table 5. Percentage of Implementation of Learning using the model STAD

Pertemuan	Persentase		Rata-rata
	Dosen	Mahasiswa	
Pertemuan 1	96 %	93 %	95 %
Pertemuan 2	100 %	96 %	98 %
Persentase keterlaksanaan pembelajaran siklus II			96 % (tercapai)

At the first meeting the percentage of learning implementation was 95%. At this meeting the activities that were not carried out included students responding to group presentations, especially groups that received questions from groups

presenting in front of the class, the lecturer made a summary related to the presentation or discussion activities that had been carried out by students, the lecturer checked the level of student understanding by asking questions brief related material to students, and all students finished doing all the practice questions at the LKM.

At the second meeting the percentage of learning implementation was 98%. At this meeting the activities that were not carried out included the lecturer arousing student motivation by conveying the benefits of the material to be studied, the lecturer checking the level of student understanding by giving short questions related to the material to students, and all students finished working on all the practice questions at the LKM.

3) Reflection on Cycle II

Based on the results of the implementation of cycle II actions, the observations of researchers, the results of observations through observation sheets on the implementation of learning and discussions with lecturers plus interviews with students and lecturers, the researchers draw the following conclusions:

a) Mathematics learning activities using the STAD type cooperative model with a guided discovery approach are more effective than cycle I.
b) Based on data from achievement test results in cycle II, students who complete the KKM have increased.
c) Based on the observational data of the implementation of learning, the implementation of learning using the STAD type cooperative model with the guided discovery approach has exceeded the target, meaning that learning with this approach has been carried out well.

At the end of cycle II, the lecturers and researchers agreed to stop the research on the grounds that the indicator for the success of this research had been achieved, namely an increase in the average student achievement from cycle 1 to the next cycle and at least 75% of students achieved a KKM score of 75, the percentage of implementation of learning using the STAD type cooperative model with a guided discovery approach of more than 90% and the average student curiosity questionnaire has reached the high criteria. The final results of this study are as follows:

Table 6. Final Research Results

Variabel	Interval	Kriteria	Akhir Siklus 2
Afektif Rasa Ingin Tahu	$X > 126$	Sangat Tinggi	29%
	$102 < X \leq 126$	Tinggi	53%
	$78 < X \leq 102$	Sedang	18%
	$54 < X \leq 78$	Rendah	0%
	$X \leq 54$	Sangat Rendah	0%
Rata-rata			113 (Tinggi)
Kognitif/keterampilan	yang tuntas ≥ 75	**KKM tercapai**	88%
	Rata-rata	75	82
Proses Pembelajaran	terlaksana $\geq$ 90%	**Pembelajaran Berhasil**	96%

The classroom action research that was carried out stopped in cycle II because for each of the domains that were measured, namely student curiosity, learning implementation, and student achievement that had been carried out had reached the targets set at the beginning. Mathematics learning using the STAD type cooperative model with a guided discovery approach at Pamulang University has been carried out according to the procedure. Learning begins with the division of the group into 4 groups. Efforts made by researchers to find out the increase in student curiosity were carried out by filling out a questionnaire that measured student curiosity. In measuring student achievement, evaluation questions are used which contain the meaning of market balance, examples of market balance and solving market balance using graphical, substitution, elimination and combination methods for cycle I as well as material for making models and solving models of problems related to market balance for cycle II. Student curiosity questionnaires and evaluation questions are given at the beginning and end of the cycle. Meanwhile, in measuring the achievement of the implementation of learning, observation sheets are used which are given at each meeting to assess the activities of lecturers and students.

The implementation of learning mathematics using the STAD type cooperative model with a guided discovery approach is carried out following the steps that have been determined. Before starting the learning process, the lecturer directed the class leader to lead the prayer. Then the lecturer checks student attendance. At this meeting all students were present to take part in the lesson. Next, the lecturer asks questions that relate previous knowledge to the material to be studied as apperception. The lecturer asked one of the students to ask questions related to the material being taught. Lecturers provide examples as inducements for students to describe material. Lecturers continue the learning process by providing motivation to students by associating material in everyday life.

Next, the lecturer explains the learning activities that will be carried out using the Student Worksheet. In the first stage students have group discussions to complete the activities in the LKM. In the discussion, each group has the same responsibility in completing all activities in the LKM. The lecturer goes around the class to guide students who are having difficulties. In the next stage the lecturer appoints several groups to present the results of their group discussions in front of the class. Lecturers ask students to pay attention to the presentation that is displayed in front of the class. Other groups provide responses to the answers presented. When this class discussion took place, the lecturer continued to guide so that the discussion did not extend beyond the material being discussed and focused on indicators of competency achievement.

After the class discussion is over, the lecturer guides students to make conclusions. Furthermore, the lecturer gave several practice questions and assignments to be done at home to students. At the end of the lesson, the lecturer closed the lesson by asking students to pray. Based on the results of the research described previously, it is known that learning mathematics using the STAD type cooperative model with a guided discovery approach has been able to increase the curiosity of Pamulang University students.

CONCLUSIONS

Based on the results of the research and discussion that have been described, it is concluded that learning mathematics using the STAD type cooperative model with a guided discovery approach can increase the curiosity of D3 Accounting students at Pamulang University. The results of the questionnaire measuring student curiosity in cycle I increased from 101 to 113 in cycle II. The increase occurred in each category. For the very high ability

student category from cycle I it was 18% and in cycle II it became 29%. For the high category there was an increase from cycle I which was initially 35% to 53%. Results in the moderate category decreased from initially 35% in cycle I to 18% in cycle II.

In addition, an increase also occurred for the average value of students. From cycle I it increased by 7.00, from an average of 75 in cycle I it increased to 82 in cycle II. In addition, in cycle I, the percentage of students who achieved KKM scores (above 75) had not reached 75%, namely only 71%, while in cycle II, the percentage had reached the target of 75%, namely 88%. From this description it can be said that the curiosity and achievements of D3 University Accounting students have increased from cycle I to cycle II.

Based on the results of observations of the implementation of learning, learning mathematics using the STAD type cooperative model with a guided discovery approach has been well implemented. The average percentage of the results of observations of the implementation of learning at meetings 1 and 2 in cycle I respectively was 82% and 89% with an average of 86%. This result has not reached the set target of ≥ 90%. In cycle II it has reached a percentage above 90%, with the percentage results at meetings 3 and 4 both successively being 95% and 98% with an average of 96%.

Learning mathematics using a cooperative model of the STAD type with a guided discovery approach at the D3 Accounting University of Pamulamh has been carried out according to the procedure. The implementation of learning mathematics using the STAD type cooperative model with a guided discovery approach has been carried out following the steps that have been determined.

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