

EFFORTS TO IMPROVE UNDERSTANDING STUDENTS IN GROUP THEORY THROUGH LESSON STUDY WITH COOPERATIVE LEARNING MODEL OF TYPE JIGSAW

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The purpose of the activities of the lesson study on course structure of Algebra is to improve lecture planning, lecturing process, lecturer-student interaction, learning media, and improvement of group learning culture and learning outcomes through cooperative learning model of type Jigsaw. This research is Lesson Study conducted collaboratively involve the Lecturer Department of mathematics education Halu Oleo University by as much as 7 people. This research was conducted in four cycles and is done in three stages, namely the Plan, Do, and See. The results of this lesson study activities include: (1) there is a planning method of repair and improvement lectures learning devices, (2) lecturer-student interaction that is more productive and fun, (3) the lecturer got input from colleagues review for improving the quality of lectures, (4) the student is getting passionate with increased coursework is nothing more than 71.7% finished with an average of 63.58.

Keywords : Lesson Study, Cooperative, Jigsaw

1. INTRODUCTION

Algebraic structure of the courses is one of the courses given at the program Level-1 (S1) mathematics education. The granting of such courses intended to students understand some structures in the algebra, and can apply it to resolve the problem in a simple algebra, as well as being able to think logically and bernalar in math in solve a problem. Thus, the algebraic structure of the courses are very important to master students in order to increase the power of deductive reasoning, logical and systematic way.

Algebraic structure of the courses as part of modern algebra is a structure subject to strict axiomatic deductive. As expressed Birkhoff (1941) "the most striking characteristics of modern algebra is the deduction of theoretical properties of formal systems such u.s. groups, rings, fields, and vector spaces". To that end, algebraic structures loaded with definitions and theorems so that students in the study required the ability to prove the theorem, and can make use of definitions and theorems exists in solve problems in General the shape of proof. Kromodihardjo (1990) asserts that in the courses algebra structure we do not do a calculation, but only learned of the concept.

Importance of proof in algebra structure of courses can be viewed on textbooks which always cite problems in the form of proof. Like the textbooks written Birkhoff (1941, 1979); Kromodihardjo (1988); Sukahar (1997); Suradi (1997) are generally given questions is a matter of proof.

Based on the author's experience in teaching courses in algebra structure Department of mathematics education by Haluoleo University is implemented lecturer teams consisting of 2 people and moreover is not done with the management team teaching. The management thus appears to be that the ability of student interaction in absorbing material and proof of concept demonstrates the difficulty of describing the interaction of active progress record students who support the understanding of the lecture material in the class. As for the acquired values of students on courses algebraic structures of 75% get the value that was less satisfactory with C, D, E. Anything else that can be reported is the value of courses as algebra structure courses requires absolutely insight that has been completed to the materials theory group.

These circumstances indicate strongly that mathematics education majors are still having difficulty dominate in group theory specifically associate the information known and that will be proven in a matter. Although in the process of lectures each exercise always appear a matter of proof. Perhaps, the difficulty students associate the concepts that are so much against the problems faced, so having difficulties determining step that will prove a problem. Based on this fact then the need of implementing Lesson Study as an effort to apply the principles in Total Quality Management, i.e., improve processes and student learning outcomes on an ongoing basis that can be encourage the formation of a community learning (learning society) are consistently and systematically committing self improvement, both on an individual level or managerial.

Lesson study is a model of the coaching profession of educators through the study of collaborative learning and sustainable based on the principles of mutual learning and collegiality to build a learning community (Rusman, 2010). Lesson study is selected and implemented for several reasons. First, an effective way that can improve the quality of learning done teachers and students learning activities through learning model to suit the material to be taught. Second, the lesson study design with a good teacher will make a professional and innovative (and Catherine Lewis, 2002). According to Cerbin and Kopp (2006) says the lesson study can improve in terms of knowledge about the subject matter, knowledge of the instructions, the ability to observe students, strengthening collegiality, a strong connection to the long term, motivation and sense of accomplishment, as well as the quality of the lesson plans are available. It also can improve teaching and learning as well as overcoming obstacles in the implementation of learning.

Sukirman (2006) looked at lesson study as a model coaching profession educators through the study of collaborative learning and sustainable based on the principles of mutual learning and collegiality to build a learning community. Thus the lesson study is not a method of learning or learning strategies. However, in an activity lesson study can be used a variety of methods, strategies, or learning approach to suit the circumstances, conditions, and issues facing educators.

One of the learning models applied in the implementation of the lesson study this is a cooperative learning model of type jigsaw construction as an effort to improve the quality of the learning process of students conducted by a group of lecturers in collaborative and continuous, in planning, implementing, observing and reporting on results and associated costs. According to Isjoni (2010) cooperative learning of type jigsaw is one type of cooperative learning, which encourages active learners and help each other in mastering the teaching material to achieve maximum achievement.

Huda (2011) explained that when carrying out the cooperative learning model of type jigsaw, learners work group for two times, i.e. in their own group and the Group of experts. Assembly of the students who have the same information known by the term "expert" groups. In a group of "expert" is each student discussing each other and find the best way how to explain parts of that information to friends of one of the group that originally. After the discussion is completed, all

students in the Group of "experts" it back to the original group, and each of them began to explain the information to friends of one of the group.

The purpose of the activities of the lesson study on course structure of Algebra is to improve lecture planning, lecturing process, lecturer-student interaction, learning media, and improvement of group learning culture and learning outcomes through cooperative learning model of type Jigsaw.

2. RESEARCH METHODS

This research is Lesson Study undertaken collaboratively, meaning researchers involve others or colleagues who come to observe the implementation of the action and also give feedback to researchers so that research be objective. Another person or colleague who referred to in this research is a lecturer in the Department of mathematics education Halu Oleo University by as much as 7 people.

The activities of the lesson study was conducted in the laboratory of mathematics education on student program an courses structure of Algebra 1 with the reference library: Herstein (1). 1975. Topics in Algebra. John Wiley & Son: New York, (2) Sukahar., Kusri. 1997. Algebraic structures I. Press University IKIP Surabaya: Surabaya, and (3) Suradi, 1997. Group Theory. Diktat, FPMIPA IKIP Ujungpandang. This research was conducted in four cycles and is done in three stages, namely, planning (Plan), implementation (do), and reflection (see). The flow of lesson study as follows (Rusman 2010):

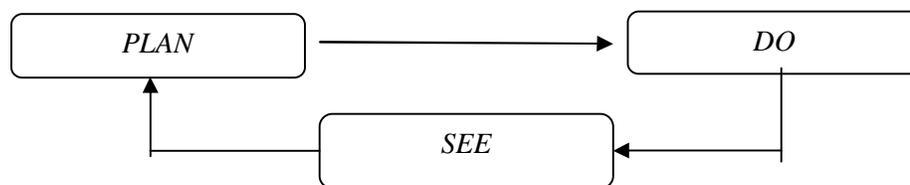


Figure 1 Groove Lesson Study

The steps that will be taken in this research are as follows:

1. Do the observation before the implementation of Lesson study

Before entering directly into the field to do first is to do the observation before implementing the Lesson Study. Then the thing to do is look at the observations in the room, doing the initial assessment of student achievement.

2. Planning (Plan)

Planning to do is craft a scenario lectures conducted by lecturers in collaboration to develop the device classes that reflect student-centered learning with a learning cooperative model of type jigsaw

3. Implementation (do)

In the implementation stage of applying lecturers model then lecturers model implement the lecture tools that have been prepared by the Lesson Study group.

4. Reflection

At this stage, model lecturers given the opportunity of expressing the effects during the carrying out of the activities of learning, both against students who faced as well as himself. The observer further convey the results of his observations and the last lecturers model gives feedback on the assessment of observer. It is important in this stage is to reconsider the plan of lectures have been compiled as a basis for improvements to the next learning plans.

3. FINDINGS AND DISCUSSION

The results of the implementation of the activities of the lesson study specified by the following stages:

A. Planning Phase

This step generates a few things such as the following: (1) the availability of appropriate Lecture Event Units with learning cooperative model of type Jigsaw, learning media in the form of slides, Student Worksheet (MFI), sheet observasi activity student interaction and learning materials, (2) the availability of materials for the implementation of a camera handy camp, structuring cooperative learning class that supports jigsaw, floor plans of the Group and names of group members, the floor plan layout of the observer (3) availability of scheduled time the implementation of activities and a list of student names on target.

B. Implementation Phase

At the time of implementation is performed according to the specified time, the tools and the media according to plan and the materials that have been prepared. All components (lecturers model, observer and carry out its functions documentary ready) ready on time in the classroom. As for the activities of lecturers model are outlined below:

1. Conveys the purpose of the lecture and do apperception
2. Give the motivation (in the form of problems that challenge the students).
3. Lecturer of directing students gather into their respective groups
4. Lecturers allot of Student Worksheet (MFI), to each member of the group
5. Lecturer do the orientation of the concept of the concept of matter as well as show some examples and not the example.
6. Lecturer of directing to any member of the group in order to spread on a group of experts based on the number of problems on the MFI
7. Lecturer observe and provide encouragement, guidance for the discussions in the expert group completed the MFI and explain the question of students if any student is not understood.
8. Lecturers supervise and ensure knowledge of the members of the Group of experts before returning to his native groups
9. Lecturer of directing it back to its original group to explain the outcome of its discussions in the Group of experts
10. Lecturer monitoring the origin of group discussion
11. Lecturer of directing and guiding class discussions
12. Lecturer directing the students to be able to conclude the matter and the result of the settlement of the question of the MFI.
13. Review and conclude the matter together with the student
14. Do the evaluation.

C. Evaluation/Reflection Phase

Evaluation/reflection is implemented after implementation phase. Reflection and evaluation done any good against the end of the cycle the learning process involving the interaction activities of students as well as student learning outcomes and student learning outcomes corresponding also conducted the final evaluation for materials theory group as the value of the Midterm.

Based on the results of evaluation/reflection reached findings as follows:

1. Lecturer of designing appropriate student guidance classification cooperative of type jigsaw grouping strategies by conducting carefully so that the student fulfilled the heterogeneous grouping either in original or groups of experts with detailing that arrangement student no. 1

in the original group of students occupied not absolute strength category but are arranged alternately to mahasiswa strength category occupies the last sequence of the arrangement. Classification is based on the value of the course prerequisites and initial tests.

2. Arrangements classroom should be arranged in advance in order to be conducive to discussions and cooperative work
3. Students enthusiastic and happy to follow the lecture cooperative of type jigsaw because it moved by the spirit of the individual's responsibility to understand the material because it is based on interviews with several students expressed there feelings of shame if can not explain his craft to a friend of the group comes from.
4. Get to know the students carefully can be done with the attendance of the calling name followed by the video footage against the student.
5. There is one person from the Group III students who are unable to master his craft in the expert discussions resulting in it out of the classroom and not be accountable to members of the group.
6. The lecturer take the exchange of expert or group of experts lending another origin when there are lectures on the original group members were not present.
7. The lecturer model do emphasis the understanding of the concept of University students against the material of lectures which are abstract algebraic structures such as by passing restatemen or restates the analytic definition of a material other than the written dipapan and as far as possible be the geometric representation of sketched over the concept that dipapan wrote.

Based on the results of evaluation/reflection activities result was reached as follows:

1. Improvement of methods of planning of lectures conducted collaboratively with colleagues conducted two days before the meeting scheduled in the lecture.
2. Improvement of learning devices specifically Lecture Event Units in accordance with guidance and students phenomenon of the cooperative jigsaw processed arising at any lectures, as well as MFI learning materials to suit the material.
3. Interaction of lecturers – student more productive with a focus upon the expert group discussions followed by a student's interaction with one of his group with the driven spirit of responsibility.
4. The lecturer got the input completion of planning from peers for the quality improvement process and the results of the lecture on an ongoing basis.

Table 1. Student Learning Outcomes

1.	The average result of lecturing cycle evaluation to-				Average Value
	Cycle I	Cycle II	Cycle III	Cycle IV	
	56,49	58,45	61,65	64,24	63,58
2	Achieved Target Exhaustiveness				Thoroughly
	Cycle I	Cycle II	Cycle III	Cycle IV	
	59,34%	61,41%	62,43%	65,46%	71,7%

4. CONCLUSION

The conclusions from the results of this study lesson activities include: (1) there is a repair method planning lectures, (2) there is a learning device repair, (3) a lecturer - students interaction is more productive and enjoyable, (4) lecturer getting input from his colleagues for improved quality and associated algebraic structures, (5) a student getting passionate with increased coursework is nothing more than 71.7% finished with an average of 63.58 from initial target set out i.e. a number of 55% student satisfaction in classical obtained average value > 50 .

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