

THE RESOLUTION INTEGRAL APPROACH TO METACOGNITION IN MATH EDUCATION STUDENTS OF HALUOLEO UNIVERSITY**UTU RAHIM¹, LA MISU²**¹ DEPARTMENT MATHEMATIC EDUCATION UHO , uturahim56@gmail.com² DEPARTMENT MATHEMATIC EDUCATION UHO, lamisuhamid@yahoo.co.id**ABSTRACT**

The purpose of this study were: (1) to determine the student metacognition in problem solving integral in the Department of Mathematics Education UHO, and (2) to train students to always give a reason for each step in problem solving integrals. The research was conducted at the Department of Mathematics Education student Halu Oleo university (UHO) in Semester Academic Year 2013/2014. Subjects of this study math education student who programmed Integral Calculus course, the number 71 is composed of men are 30 student and women there are 41 student. The procedures implementing this study using Lesson Study approach and implemented by three stages or cycles. Each cycle includes three stages, namely Plan, do, and see. This research has produced four learning device on Integral Calculus courses, namely (1) Class Plan, (2) teaching materials, (3) Student Worksheet, and (4) Observation Sheet. Each device comprising 3 or 3-phase meetings made at the time of plan. Execution do, produce documents such as photos and video learning implementation for 3 cycles. And the results of the reflection of the three cycles as follows. First: The results of the evaluation of 10 students each group can solve the problems of integral, but generally the students have not been able to explain and comment every step of the problems. Being the results of observations on the implementation of learning lecturer has reached 90.86% and new student activity reached 77.7%. Second: The results of the evaluation of the 10 groups of students, in addition to each integral can solve problems, but only two groups have been able to explain and comment every step problems. Being the results of observations on the implementation of learning lecturer has reached 91.50% and new student activity reached 80.1%. Third: The results of the evaluation of the 10 groups of students, has 5 groups capable of explaining and commenting every step of the integral problems. Being the results of observations on the implementation of learning lecturer has reached 92.86% and new student activity reached 83.3%.

Keywords: Problem Solving Integral Approach Metacognition

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A. INTRODUCTION

Learning integral calculus in the Department of Mathematics Education UHO tend done conventionally ie more likely to emphasize on how lecturers teaching (teacher-centered) than on how student learning (student-centered), and the overall result is not much to contribute to improving the quality of processes and results student learning.

Based on the author's experience in teaching the integral calculus, mostly students in problem solving integral integral mostly just memorizing formulas or memorizing techniques of integration. Rarely do students solve problems based on the concept of integral integral. It can be seen from the results of student answers when solving problems in front of the class, students expressed confusion in the initial idea to completion. Sometimes also the idea initially but students can already confusion to continue the next step. Sometimes the students also can menyelesaikan completely about the integral, but they have not been able to reveal the reason for each step. In fact, the learning process is always given integral concepts and examples integral settlement based on concepts integral.

Based on the above facts, the author tries to provide learning Metacognition integral calculus approach. Purpose approach metacognition in the learning process is the integral calculus students are trained to always give a reason for each step in problem solving integrals. Thus, students are always aware of using his thinking in giving formal reasons integral to all problems. This is in line Biryukov opinion (2003) that the concept of metacognition is someone thinking about thinking alleged that include metacognitive knowledge (awareness someone about what he knew), metacognitive skills (awareness of someone about something that does) and metacognitive experience (one's awareness about the cognitive abilities possession). Furthermore, knowledge of metacognition includes declarative knowledge (declarative knowledge), procedural knowledge (procedural knowledge), and knowledge of the conditional (conditional knowledge) (OLRC News, 2004). Declarative knowledge is knowledge of oneself as a learner as well as knowledge of the strategy, skill and learning resources needed for learning purposes. Procedural knowledge is knowledge of how to use everything that has been known in declarative knowledge in learning activities.

From the above research background, the scope / purpose of this study is to investigate the process of metacognition in problem solving integral student in the Department of Mathematics Education UHO.

B. METHODS RESEARCH

1. Subjects Research

The research was conducted at the Department of Mathematics Education student Halu Oleo university (UHO) in Semester Academic Year 2013/2014. Subjects of this study math education student who programmed Integral Calculus course, the number 71 is composed of men are 30 student and women there are 41 student.

2. Factors to be Investigated

In this study, there are several factors that will be investigated. These factors were as follows:

- a. Student factor, ie look good student activity group discussion process, the ability to complete the Student Worksheet and the ability to justify every step troubleshooting Integral Calculus.
- b. Factors lecturers, namely by taking into account the learning process steps if appropriate learning plans made at the plan.

3. Implementation Procedures Research

The procedures implementing this study refers to the thinking Slamet Mulyana (2007) and the concept of Plan-Do-Check-Act (PDCA). The following will describe the four stages in the implementation of Lesson Study:

a. Plan

In the planning phase, the lecturers who are members of the Lesson Study lectures collaborated to develop a plan that reflects the student-centered learning. Planning starts with analyzing activity needs and problems faced in learning. Furthermore, jointly also look for solutions to solve all the problems found. Conclusions from the analysis of the needs and problems into parts that must be considered in planning the course, so the lecture plan into a plan that really is very mature, in which able to anticipate all possibilities that will occur during the execution of the learning takes place, either at an early stage, stage core up to the final stage of learning

b. Do

At the stage Do, there are two main activities, namely: (1) the implementation of learning activities conducted by faculty practice plan model for lectures that have been compiled together, and (2) the activities of observation or observation made by the other members of Lesson Study.

Some of the things that must be considered in the implementation phases, including: Lecturer implementing learning models according to the course plan that has been prepared together. Students can be pursued through the process of learning in a reasonable and natural setting. During the learning activities take place, observers are not allowed to disrupt the learning activities and distract lecturers and students. Observers do a thorough observation of the student-to-student interaction, student-teaching materials, student-lecturer, student-other environments, using observation instruments that have been prepared beforehand and arranged together. Observers can make the recording via video camera or digital photo documentation and materials for the purposes of further analysis and recording activities do not disrupt the learning process.

Observers taking notes about the students' behavior during the learning takes place, for example on the comment or discussion and cultivated students can include the name of the student, the student understanding of the construction process through the learning activities of students. Note was made based on the guidelines and sequence learning experience of students listed in the lecture plan.

c. See

The third stage is a very important stage for further efforts to improve the learning process will depend on the sharpness of the analysis of the participants based on observations of teaching practices that have been implemented. Reflection activities carried out in the form of a discussion that followed throughout the Lesson Study participants were guided by a facilitator appointed. Discussion starts from the delivery of impressions lecturer models, by submitting comments or general impression or a special impression on the learning process is done, for example, about the difficulties and problems perceived in running the course plan that has been drawn up.

C. RESEARCH RESULTS AND DISCUSSION

1. Research Results

This research has produced four learning device on Integral Calculus courses, namely (1) Class Plan, (2) teaching materials, (3) Student Worksheet, and (4) Observation Sheet. Each device comprising three meetings or 3 stages.

Implementation of the pilot study carried out with Lesson Study approach with a number of teams 3 people (lecturers models, facilitators and observers) plus 1 vote getter pictures and video.

Implementation consists of three stages, and each stage contains three activities namely: Plan, do, and see. The results of the implementation of each of these activities as follows.

The First Stage:

Plan (June 3, 2014).

Things that are planned in the implementation of the first plan as follows:

Lectures: Techniques of integration some form of the trigonometric

- Learning Model: problem-based learning approach metacognition
- Setting up a learning device associated with course material (Class Plan, Instructional Materials, Worksheet Students, Learning Media, and instruments namely observation sheets and evaluation questions)
- Students are grouped into 10 groups and each group consisted of 7 people.

Do (June 5, 2014)

- Lecturer model of implementing the learning process according to plan on plan.
- Observer and facilitator observe the implementation of the learning process, both observing the appearance faculty and student activity models.

See (June 5, 2014), Results of the first reflection as follows:

a. Evaluation Results and Observations

Results of the evaluation of 10 students each group can solve the problems of the Student Worksheet, just most of them have not been able to explain and comment every step problems. Being the results of observations on the implementation of learning lecturer has reached 90.86% and new student activity reached 77.7%

b. Strengths and weaknesses

Strengths:

- Lecturer models has prepared all the learning tools,
- Presentation of the material there is a match between the teaching materials Student Worksheet,
- Both teaching materials and Worksheet Students beginning with the problems in accordance with the model of problem-based learning.

Weaknesses

- Total students so much that the number of members of the group too large.
- Student Worksheet distributed per group not per student, so there are many members of the group are inactive.

- Liveliness good student discussion groups and individuals have not appeared.
- Metacognition approach not yet seen.

Second Stage:

Plan (June 18, 2014).

Things that are planned in the implementation of the second plan as follows:

- Lectures: Techniques of integration completes perfect squares and partial integral.
- Setting up a learning device associated with the course material with attention deficiencies in the first phase, namely:
 - 1. The ability of any member of a heterogeneous group. The distribution of values based on the value of learning outcomes 1st stage.
 - 2. Student Worksheet distributed per-member group, and discussed in groups.
 - 3. At the Student Worksheet has been prepared questions to uncover the student metacognition

Do (June 19, 2014).

- Lecturer model of implementing the learning process according to plan in the second plan,
- Observer and facilitator observe the implementation of the learning process, in addition to observing the appearance of the model is also a lecturer at the student activity specific groups.

See (June 19, 2014), The second reflection results as follows:

a. Evaluation Results and Observations

Results of the evaluation of the 10 groups of students, as well as each can solve problems Student Worksheet, there are two groups have been able to explain and comment every step problems. Being the results of observations on the implementation of learning lecturer has reached 91.50% and new student activity reached 80.1%.

b. Strengths and weaknesses

Strengths:

- Lecturer models has prepared all the learning tools.
- At the Student Worksheet has been prepared questions to uncover the student metacognition.
- Students are able to answer the problem.

weaknesses

- Students have not been able to give a reason for each step of completion.
- Students have not been able to uncover linkages material based on metacognition.

Third Stage:

Plan (June 23, 2014).

Things that are planned in the implementation of the second plan as follows:

- Lectures: Techniques of integration in the integral rational functions,
- Setting up a learning device associated with the course material with regard shortfall in the second stage, ie:
 1. Lecturer gives guidance to students in particular way of expressing metacognition students.
 2. Lecturer sent one member of the group to solve the problems in front of the class, then try to explain what has been written.
 3. Lecturer invited one other group members for responding the problems that have been written.

Do (June 26, 2014)

- Lecturer model of implementing the learning process according to plan in the third plan,
- All observers and facilitators observe the implementation of the learning process, both observing the appearance faculty and student activity models.

See (June 26, 2014), The second reflection results as follows:

a. Evaluation Results and Observations

Results of the evaluation of the 10 groups of students, as well as each can solve problems Student Worksheet, there are five groups have been able to explain and comment every step problems. Being the results of observations on the implementation of learning lecturer has reached 92.86% and new student activity reached 83.3%.

b. Strengths and weaknesses

Strengths:

- Lecturer models has prepared all the learning tools.
- Already there are students who are able to express metacognition of all problems.

Weaknesses

- Not all members of the group were able to uncover metacognition of all problems.
- There are still students who are inactive.

2. Discussion of Research Results

Based on the above results, it appears that the implementation of the learning process by lecturers models of 3 cycles goes well according to plan lectures. This is evident from the observation observer in each cycle reached above 90%. Similarly, activity and participation of students attend lectures have also been good, which each cycle reaches above 75%. Then, the results of student learning integral in solving the problems of the first cycle to the third cycle there is increasing significantly. This shows that when students are always trained to solve the problem using the metacognition learning outcomes will be good..

D. CONCLUSIONS

1. There are changes in behavior and cognitive styles for students UHO Mathematics Education in solving integral of the first cycle to cycle III.
2. Metacognition approach can enhance problem-solving skills integral to the students of Mathematics Education UHO.

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