Authentic Assessment On Mathematics Education Research Methodology Course Based Group Discussion

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Abstract—This research is a quasi-experimental study (Quasi Experimental). The variables examined in this research consisted of independent variables and the dependent variable. The independent variable is applying assessment based group discussions, while the dependent variable is the learning achievement of mathematics education research methodology. The research design is the post test-control group only design involving two groups: an experimental group and a control group. The experimental group applied assessment based discussion group, while the control group did not apply assessment based discussion groups. The population is the students sixth semester of mathematics education University of Cokroaminoto Palopo. Technique of sampling used purposive sampling based of heterogeneous class, the class chosen are class VI-A and class VI-B that each consist of 40 students from six classes. Learning achievement of students were taught using assessment based group discussions are in good category with an average score is 70.55 from the ideal score of 100, with a standard deviation is 10.11. Learning achievement of student were taught using conventional approaches are in in a average category the average score is 58.93 from the ideal score of 100, with a standard deviation of 10.25. Students learning achievement of mathematics education research methodology course were taught applying assessment based group discussion is better than students learning achievement of mathematics education research methodology course were taught using conventional approaches at the significance level \( \alpha = 0.05 \).

Keyword: Assessment, group discussion, learning

I. INTRODUCTION

Mathematics education research methodology was taught to students at university. The fundamental course and necessary in order to be able to master science and technology and also research. The realization of the importance of educational research methodology courses reflected to the placement of mathematics education research methodology as one of the basic research course for all students in mathematics education.

Start from the improvement of the quality of education, the educator or lecturer play a key role, especially in the implementation of the learning process. Similarly, the learner or student also play an important role in achieving the goals of education, especially in terms of accepting the course material.

The application of a method of teaching should be reviewed for effectiveness, efficiency, and compatibility with the characteristics of the course material as well as the state of the student involving ability, speed of learning, interest, time owned and socio-economic situation as a subject of study. One indicator of the quality of education in university can be seen from the student learning achievement. Student learning achievement is determined by various factors, including; how lecturer teaches, tools used for conveying the course matter, how lecturer provide motivation to students in order to student is happy and keep to learn.

Various problems of teaching and learning mathematics education research methodology in college these days, it is time to overcome. More specifically in the sixth semester mathematics education courses University of Cokroaminoto Palopo, has been investigated from the beginning that the educators have not found the learning achievement of mathematics education research methodology as expected. Regarding the evaluation system in the university lecturer have not yet implemented assessment based group discussions, as is known about the evaluation system is not suitable method or manner of assessment based real group discussion.
The assessment or evaluation has been dominated by test or a written assessment form. By written tests educators can assess a variety of things but not all the results of the learning process can be evaluated by the form. Many situations of assessment, where educators require non written test to determine the ability of students. In this case, the assessment in its application are required to use two forms of these tests are based assessment group discussions, so that in this study the evaluation system applied in the sixth semester mathematics education courses University of Cokroaminoto Palopo is assessment based discussion groups.

Authentic assessment (assessment-based discussion groups) is one alternative technique of evaluation of learning achievement that can provide great opportunities or participants a broader and abilities of students during the learning process takes place. Assessment based group discussions were conducted to evaluate the extent to which students learn and apply their learning achievement?

In the application assessment based group discussions, students are required not only to understand the concept or practice, but also able to formulate problems, find solutions and to interpret the results, and students are required to take action as a form of acquisition or understanding of the material in learning.

Based of the background above, the authors are encouraged to conduct the research with the title "Autentic Assessment on Mathematics Education Research Methodology Course Based Discussion Group".

Research Statement

Based on the background that have been raised, and then to impose limits on the scope of the problem at once illustrates of this research, the research statement is "it have not known the processes and learning achievement of students with the application of authentic assessment in mathematics education research methodology course based discussion group. While based on the research statement, the research questions as follows:

1. How the students learning achievement of mathematics education research methodology course on sixth semester mathematics education University of Cokroaminoto Palopo will be taught by applied assessment based group discussion?
2. How the students learning achievement of mathematics education research methodology course on sixth semester mathematics education University of Cokroaminoto Palopo will be taught without applied assessment based group discussion?
3. What the students learning achievement of mathematics education research methodology course on sixth semester mathematics education University of Cokroaminoto Palopo that applied assessment based group discussion better than without applied assessment based group discussion?

II. LITERATURE REVIEW

A. Essence of Mathematics Education Research Methodology Learning

Learning is a mental activity that can not be observed from the outside. Learning achievements can only be observed when someone appeared capabilities that have been acquired through learning. Knowledge, skills, habits, interests and attitudes are formed, modified and evolved due to learning.

According to Morgan (in Ratumanan, 2004) learning can be defined as "Any change in behavior that is relatively fixed and occurs as a result of training or experience." In line with that Rebber (in Ratumanan 2004) argues that "Learning is a are relatively permanent change in response potentiality roomates Occurs as a result of reinforced practice model, "learning is a change in the ability to react relatively fixed as a result of the exercise reinforced.

The two definition given above shows that the orientation of learning is not solely on the "results", but also on the "process", thus learning are activities that result in changes to the individual, the change in the form of new capabilities in response to a particular situation, the new capabilities can survive and function in a relatively long time, and not because the process of physical growth but for their individual effort.

Slameto (2003) suggested that teaching is an activity to try to help, lead a person to obtain, modify or develop the skills (skills), attitude (attitude), ideals (ideals), appreciations (awards), and knowledge (knowledge). Furthermore Hudoyo (1990) states that teaching is an activity undertaken by the teacher to impart knowledge / experience that has to learners. From the definition it can be concluded that the
teaching on hekekatnya is the process of delivering knowledge / experience to the learners so that learners can achieve learning goals.

According Marpaung (2003) paradigm of teaching has characteristics, among others: (1) teachers active, students passive, (2) learning centers on teachers, (3) the teacher transfer knowledge to students, (4) understanding obtained by students tend merely instrumental, (5) learning is mechanistic, and (6) students be quiet (physically) and full concentration (mental) pay attention to what the teacher taught. Furthermore, it was revealed that the learning outcomes are based on the paradigm of teaching, among others, (1) many students who are not happy in the methodology of the study of mathematics education, (2) students' understanding of the methodology of the study of mathematics education is still low, and (3) ability to solve problems (problem solving), reasoning (reasoning), communicating mathematically (communication), and see the connection between concepts and rules (connection) is low. Thus, it can be argued that in order to support the achievement of learning goals of mathematics education research methodology and improve its quality, the teaching paradigm needs to be fixed.

Learning mathematics education research methodology is a psychological process, the process is an active one's activity in an effort to understand and master the mathematics education research methodology. The essence of learning mathematics education research methodology was strongly associated with the characteristics of mathematics education research methodology as school subjects. According Soedjadi (2000) suggests several characteristics of the research methodology of mathematics education, namely: (1) object of study is abstract, (2) rests on the agreement, (3) deductive mindset, (4) has a symbol that was empty of meaning, (4) pay attention to the universe of discourse, (6) consistent in its system.

Beagle (1979) suggests four kinds of objects of mathematics education research methodology, ie facts, concepts, operations, principle. Mathematics education research methodology with regard to abstract ideas by symbols arranged in a hierarchical and deductive reasoning, thus learning of mathematics education research methodology is a high mental activity. Because mathematics education research methodology are abstract ideas by means of symbols, then before understanding the symbols, it must first be understood the ideas contained therein. In connection with the symbols in mathematics education research methodology, Soedjadi (2000) argue that there are symbols that have been given a special meaning, but generally empty of meaning. This indicates that the symbol can still be given a specific meaning in accordance with the scope or his universe.

Mathematics education research methodology serves as a tool, mindset, and science. Serves as a tool, because the methodology of the study of mathematics education is often used in solving problems in other subjects, serves as the formation of mindset, because in learning research methodology of mathematics education, students accustomed to gain understanding through the experiences of the properties owned and are not possessed of a set of objects (abstraction), the surveillance of examples and are not examples of expected student is able to capture the sense of a concept. Furthermore, with this abstraction, students are trained to make predictions, guesses, or trends based on experience or knowledge developed through specific examples, nor that the methodology of the study of mathematics education as a science, for mathematics education research methodology is always searching for the truth. The research methodology school mathematics education serves to develop the ability of counting, measuring, and using the formula lowers mathematics education research methodology in everyday life.

B. Learning Achievement of Mathematics Education Research Methodology

According to the psychological sense, learning is a change that is a change in behavior as a result of interaction with the environment in meeting their needs. These changes will be evident in all aspects of behavior. Definition of learning proposed by Slameto (1995) can be defined that learning is a process that is carried out by someone to obtain a new change in behavior as a whole, as a result of his own experience in interaction with the environment.

From the opinion that the thesis of this article is intended or learning is a change in behavior in a person as a result of interaction with the environment. The changes include changes in knowledge, attitudes / behaviors, skills, capabilities and other aspects that exist in each individual study.

Learning achievement expressed by Mulyono (Jusriah, 2005) are as follows: "The learning achievement is the ability gained after the child through learning activities."

This is in line with the opinion of Keller (Jusriah, 2005) which defines learning achievement as follows: "The result of learning is the actual accomplishment shown by the child while the business is an act directed at the completion of learning tasks."
Learning achievement are influenced by:

a. The amount of work done child / student.
b. Intelligence and mastery of early children / students about the material to be studied.
c. The existence of the opportunity given to children / students.
d. The amount of effort that is poured and the opportunity given to children / students.
e. The consequence of learning outcomes.

Assessing the learning achievement of mathematics education research methodology commonly use the test. The main intention of the test is to measure the learning achievement achieved by someone who learned mathematics education research methodology. In addition, tests were also obtained to determine how much understanding they have learned the material.

According to Popham W. J. that the achievement test is important in knowing the level of score, with the reasons for the grade level teachers will be able to know to what extent the ability of students in the school on a particular subject (Nelly, 2006).

Learning achievement achieved by students could be identified after following the learning process. Learning achievement achieved one can be an indicator of the limits, abilities, knowledge, skills and attitudes or values that are owned by that person in a job. Soedjiarto (in Nelly 2006) suggests that the learning outcomes are achieved by the mastery level students in following the teaching and learning program in accordance with the purpose of education is expected. Learning outcomes in this regard include the insights of cognitive, affective and ability or skill to a student.

Based on these descriptions, it is the learning achievement of mathematics education research methodology was achieved mastery level students in the learning process of mathematics education research methodology in accordance with the objectives to be achieved. The results achieved by pupils is a picture of the success of the learning process.

C. Essence of Assessment

Assessment is gathering information on changes in the quality and quantity of student or group. In the book Assessment Based Competency explained that the assessment is an activity to obtain information about the achievements and progress of student learning and make effective use of information to achieve educational goals.

Assessment is also a process of inference various facts and made basic professional consideration to take the policy on collection of information, which contains information about the learners. Therefore, the assessment helps teachers and educators to plan curriculum and instruction in teaching and learning program, then the assessment requires information that varies from each individual or group of educators and learners.

D. Hypothesis

Based of the theoretical framework explanation then the hypothesis in this research is:

"Learning achievement mathematics education research methodology at student class VI-A Mathematics Education University of Cokroaminoto Palopo taught with assessment based group discussion is better than learning achievement mathematics education research methodology of students class VI-B Mathematics Education University of Cokroaminoto Palopo without applying assessment based discussion group"

III. METHODS

A. Variable and Research Design

This research is a quasi experimental research. The variables examined in this research consisted of independent variables and the dependent variable. The independent variable is application of assessment based group discussions, while the dependent variable is the learning achievement of mathematics education research methodology.

The research design used in this research is the only post test control group design involving two groups: one as an experimental group and one as a control group. The experimental group applied assessment based discussion group and the control group with no applied assessment based discussion groups.
Table 2. Model of research design (Arikunto, 2001).

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Post test</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Applying assessment based group discussion</td>
<td>T</td>
</tr>
<tr>
<td>B</td>
<td>Without applying assessment based group discussion</td>
<td>T</td>
</tr>
</tbody>
</table>

Explanation:
A = Experimental group
B = Control group
T = Test of learning achievement

B. Operational Definition

Operationally, the variables that were examined in this study can be explained as follows:

1. Assessment based group discussion in this research is an evaluation process of the appearance of influencing the achievement of student learning, motivation and behavior within the scope of activities interconnected instructional.

2. Learning achievement of educational research methodology of mathematics education research methodology defined as the value that indicates the level of mastery of the subject matter of mathematics education research methodology derived from the provision of achievement test in the control group and the experimental group.

3. Learning activities are all activities done by the students during the learning process, either the ability or cognitive skills (knowledge) and psychomotor (practical work) obtained from non-test assessment sheet through observations (observation).

C. Population and Sample

Population in this research were all students of sixth semester of Mathematics Education University of Cokroaminoto Palopo. Based on a heterogeneous class, Sample was taken by purposive sampling, chose two of six parallel classes in sixth semester. The two class is a class VI-A are about 40 students and a class VII-B 40 students.

D. Time and Location

This research conducted in program of study of mathematics education at University of Cokroaminoto Palopo, was held during odd semester.

IV. RESULTS AND DISCUSSION

A. Results

1. Result of Descriptive Analysis

   a. Students learning achievement of mathematics education research methodology taught using mathematics education research methodology with assessment based group discussion (experimental class)

The results of descriptive statistical analysis relating to the variable score student learning achievement are taught using mathematics education research methodology with assessment based group discussions are presented in Table 1 and can be seen in the attachment.

Table 1: Description of the distribution score of student learning achievement taught mathematics education research methodology applying assessment based group discussion

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Statistic Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of Sample</td>
<td>40</td>
</tr>
<tr>
<td>Maximum Score</td>
<td>95</td>
</tr>
<tr>
<td>Minimum Score</td>
<td>50</td>
</tr>
<tr>
<td>Range</td>
<td>45</td>
</tr>
<tr>
<td>Mean</td>
<td>70,55</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>10,11</td>
</tr>
<tr>
<td>Variance</td>
<td>102,31</td>
</tr>
</tbody>
</table>
Based on Table 1. The maximum score obtained by the student is 95, the minimum score is 50 with a range is 45. If score of learning achievement of mathematics education research methodology taught using mathematics education research methodology applying assessment based on group discussion divided into five categories, then obtained frequency distribution and percentages as shown in the following table:

Table 2. Distribution of frequency and percentage of student mathematics achievement of mathematics education research methodology taught using mathematics education research methodology applying assessment based group discussion.

<table>
<thead>
<tr>
<th>Score</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 39</td>
<td>Very Bad</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40 – 54</td>
<td>Bad</td>
<td>3</td>
<td>3.8</td>
</tr>
<tr>
<td>55 – 74</td>
<td>Average</td>
<td>21</td>
<td>26.6</td>
</tr>
<tr>
<td>75 – 89</td>
<td>Good</td>
<td>14</td>
<td>17.6</td>
</tr>
<tr>
<td>90 – 100</td>
<td>Very Good</td>
<td>2</td>
<td>2.6</td>
</tr>
</tbody>
</table>

From Tables 1 and 2 above, obtained information that the average score of the students learning achievement of mathematics education research methodology taught using assessment based group discussions 71.45 of the maximum score may be achieved is 100, with a standard deviation of 11.43 and variance of 130.72. Of categorizing students learning achievement of mathematics education research methodology, it can be said that the students learning achievement of mathematics education research methodology program of study of mathematics education University of Cokroaminoto Palopo taught using mathematics education research methodology applying assessment based on group discussions considered good.

b. Student learning achievement mathematics education research methodology taught using conventional approach (Control Class)

The results of descriptive statistical analysis relating to the variable score student learning achievement are taught using conventional approaches are presented in tables 3 and can be seen in the attachment.

Table 3. Description of the distribution score of student learning achievement taught mathematics education research methodology applying conventional approach.

<table>
<thead>
<tr>
<th>Statistic Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of Sample</td>
</tr>
<tr>
<td>Maximum Score</td>
</tr>
<tr>
<td>Minimum Score</td>
</tr>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Average Score</td>
</tr>
<tr>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Variance</td>
</tr>
</tbody>
</table>

According to the table 3 shows that the maximum score obtained for a group of students who apply conventional approaches (control class) with a maximum score is 86 and the minimum score is 40 with range is 46. If the score results of the mathematics education research methodology taught using conventional approaches grouped into five categories, the obtained frequency distribution and percentages as shown in table 4 below.

Table 4. Distribution of frequency and percentage of student mathematics achievement of mathematics education research methodology taught using mathematics education research methodology applying conventional approach (control class).

<table>
<thead>
<tr>
<th>Score</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 39</td>
<td>Very Bad</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40 – 54</td>
<td>Bad</td>
<td>11</td>
<td>13.9</td>
</tr>
<tr>
<td>55 – 74</td>
<td>Average</td>
<td>18</td>
<td>31.2</td>
</tr>
</tbody>
</table>
From Tables 3 and 4 above, obtained information that the average score of the student learning achievement of mathematics education research methodology of program of study of mathematics education University of Cokroaminoto Palopo taught using conventional approaches for 58.93 of the maximum possible score achievable is 100, with a standard deviation 10.25 and variance of 105.09. From students learning achievement categorization of mathematics education research methodology course, students and others in the above description, it can be said that the learning achievement of mathematics educational research methodology course of mathematics education University of Cokroaminoto Palopo taught using conventional approaches are being considered.

2. Prerequisite Analysis Test

Test of normality of the data in this research, used the assumption of Central Limit Theorem (CLT). Agung (1992) suggested that the requirements of the receipt of the assumptions or prerequisites normal distribution for sample size is sufficiently large (n = 30 or more) Further Tiro (1999) suggested that the values of n is large, n ≥ 30, the t distribution approaches the standard normal distribution.

This is in line with the opinion of Slaughter (1971) who argued that “The number of samples of 30 or more will provide an appropriate approximation (normal data). Although we do not impose limits on not normal or abnormal the data, the number of samples of 30 or more to meet the standard of educational research”. Because the sample of 40 people (more than 30), it can be assumed that the data in this study and the normal distribution to meet the standard of educational research.

3. Hypothesis Test

Based on the analysis, the obtained value of \( t_{\text{hit}} = 5.105 \) with significance level \( \alpha = 0.05 \) was obtained \( t_{\text{hit}} = t_{0.05;38} = 1.68 \) means \( t_{\text{hit}} > t_{\text{tab}} \). This suggests that \( H_0 \) ignored and \( H_1 \) accepted. It can be concluded that the students learning achievements of mathematics education research methodology program of study of mathematics education of students taught using assessment based group discussion is better than students learning achievements mathematics education research methodology program of study of mathematics education of students taught using the conventional approach University of Cokroaminoto Palopo.

B. Discussion

Based on the results of descriptive analysis indicate that the student learning achievement of mathematics education research methodology course of program of study of mathematics education of University of Cokroaminoto Palopo taught assessment based group discussion considered good. This is seen from the average score obtained for 70.55 or 70.55% of the maximum possible score of 100 was achieved in the interval 55-74 with variance 102.305 and standard deviation 10.11. This is due not solely due to the effect of the application of learning research methodologies mathematics education with the assessment based on group discussion in teaching methodology of the study of mathematics education, but including the variables that can not be fully controlled in this study as a way of learning, motivation, learning tools etc. However, if the effect of learning with the learning of mathematics education research methodology with assessment based discussion group is dominant in this study. Then the results of learning "good" achieved by the students because students actively in learning activities, because he thinks and uses his own ability to solve problems. Students can understand the material, because in this method the students discover and investigate its own problems given medium. This is evident from the average score obtained at 58.93 or later the problem was associated with the real world and resolve issues privately provided with the guidance of teachers.

While the results of students learning achievement of mathematics education research methodology of program of study of mathematics education University of Cokroaminoto Palopo taught using conventional approaches categorized 58.93% of the maximum possible score of 100 was achieved in the interval 55-64 with variance 105.09 and standard deviation 10.25. This happens due to the density of the given concepts students are not able to master the learning materials, teacher-centered activities so that students become passive, blocking the response of students learning and memory limit student.

Based on the above, indicate that the student learning achievement of mathematics education research methodology taught applying assessment based discussion group is better than the students learning achievements taught by conventional approach. In mathematics education research methodology with assessment based group discussions provide an opportunity to rediscover and construct concepts of
mathematics education research methodology is based on a realistic problem. Realistic situation in the problem allows use informal ways to solve the problem. Classroom interaction scheme through linkages will be stronger so that their understanding of the concept itself becomes stronger construction.

V. CONCLUSION

1. Students learning achievement of mathematics education research methodology course of mathematics education of University of Cokroaminoto Palopo taught using mathematics education research methodology with assessment based on group discussions are in good category with an average score of 70.55 from the ideal score of 100, with a standard deviation of 10.11.

2. Students learning achievement of mathematics education research methodology course of mathematics education of University of Cokroaminoto Palopo taught using conventional approaches are in an average category with the average score of 58.93 from the ideal score of 100, with a standard deviation of 10.25.

3. Students learning achievement of mathematics education research methodology course of mathematics education University of Cokroaminoto Palopo taught using mathematics education research methodology with the assessment based group discussion is better than students learning achievements of mathematics education research methodology taught using conventional approaches to the significance level $\alpha = 0.05$.

REFERENCES


