PROCEEDINGS AISTEEL 2017

THE 2ND ANNUAL INTERNATIONAL SEMINAR ON TRANSFORMATIVE EDUCATION AND EDUCATIONAL LEADERSHIP

Educational Research to Endorse Productive and Innovative Generation in the 21st Century

16-17 October 2017
Ball Room Grand Mercure Hotel, Medan - Indonesia

Organized by:
Post Graduate School
State University of Medan
North Sumatera, Indonesia

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“Educational Research to Endorse Productive and Innovation Generation in The 21th Century”

Grand Mercure Hotel, Medan City, North Sumatera, Indonesia
October 16-17, 2017

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Preface

The 2nd Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL with web link is http://aisteel2017.unimed.ac.id/) was held on October 16 -17, 2017 in Medan City, Indonesia. This conference was organized by Postgraduate School, State University of Medan (Unimed) and is the routine agenda at Unimed now. The Second Annual International Seminar on Transformative Education and Educational Leadership’ is realized this year with various presenters, researchers, lecturers and students from universities both in and out of North Sumatera participate in the theme of which is “Educational Research to Endorse Productive and Innovative Generation in the 21st Century.”

2nd AISTEEL is the annual international seminar with main aim is to discuss of recent research special for Transformative Education and Education Leadership. Several topics like: Teachers Education Model, Research Global Issue in Education, Mathematics and Science Education, Social, Language Education, Vocational Education, Curriculum, Economic, History and Management Education have been discussed at the 2nd AISTEEL 2017. 2nd AISTEEL international seminar provided experts’ view on transformative education and educational leadership as well as curriculum article presentation. There were five keynote speakers have been came Professor Keiichiro Yoshinaga, Dr. Bambang Sumintono, Dr. Sitti Maesuri Patahuddin, and Dr. Yulia Rahmawaty. The organizer had been use online submission system to receive all abstract, full paper and also communication with authors. All of information include with comment of reviewer can be cheked real time by author.

Chairperson

Dr. Rahmad Husein, M.Ed
Welcoming Speech of Director of Postgraduate School State University of Medan

The Second Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL)

Good Morning

Welcome the honorable guests speakers Professor Keiichiro Yoshinaga, Dr. Bambang Sumintono, Dr. Sitti Maesuri Patahuddin, Assoc. Prof. Emilia Zulmira de FAN, and other speakers, lecturers and students from outside and inside Unimed to this international seminar which is the routine agenda at Postgraduate program of Unimed now. I’m glad that ‘The Second Annual International Seminar on Transformative Education and Educational Leadership’ is realized this year with various presenters, lecturers and students from universities both in and out of North Sumatera and participate in the theme of which is “Educational Research to Endorse Productive and Innovative Generation in the 21st Century.”

Ladies and Gentlemen,

In this second seminar excels the first one related to the administration by online and the publication index by either Thomson Reuters or Google Scholar. By the new policy on student’s publication, postgraduate program really matches the system, particularly for the students who will sit in the oral defence examination. Through the seminar, the postgraduate students improve their article journal writing and it is proved by many articles are submitted by the students.

The plenary speakers coming from 15 provinces in Indonesia will present topics covering multi disciplines. They will contribute a lot of inspiring inputs and new knowledge on current trending educational research topics all over the world. The expectation is that all potential lecturers will share their research findings to educational scientists and researchers as well for improving their teaching process and quality. Thus, this will contribute to the next young generation researchers to produce innovative research findings in education and educational leadership contexts.

This second seminar continues the promotion of the first sequel ‘Developing Future Teachers’ Education Model. Therefore, the propose of this second seminar on the transformative education and educational leadership research will trigger the young professional lecturers and educators to compete in the invention of innovative educational teaching and learning strategies, techniques and leadership.

I hope that the scientific attitude and skills through research will promote Unimed to be a well-known university which persists to be developed and excelled in the future.

Thank you the Rector of Unimed who always supports us in organizing the seminar. Thank you all guest and plenary speakers. Special thanks to both steering and organizing committee who have well-coordinated and collaborated in actualizing the seminar.

Director of Postgraduate Unimed

Prof. Dr. Bornok Sinaga, M.Pd
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Cultivating Children’s Critical Attitude with Educational Philosophy
Daulat Saragi
Differences in Mathematics Problems Solving Students With Implementing Learning Model Think Pair Square and Group Investigation in Junior High School

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Abstract—Think Pair Square and Group Investigation are models cooperative learning to used teach students to active in learning. Cooperative learning model gives students the chance to work together with other students to improve problems solving skills. The purpose of this study is to test difference in mathematical problem solving ability of students taught by cooperative learning and the interaction between models learning towards problem solving abilities. This study is a quasi-experimental research using two classes experiment. The research subject is determined based on random sampling class and measurement instruments using essay test. The results of measurements of problem solving ability in the form of data and analysis varians two path. Base on the data analysis, average varians the different problem solving ability students with Fcount=13.105, and the interaction between learning model towards problem solving ability with Fcount=5.774. The results of analysis varians shows that the values problem solving ability and the interaction learning models between toward problem solving ability more than 4.001, this means that H0 refused and H1 accepted so that there is the different problem solving ability and interaction between learning models toward problem solving ability taught cooperatives learning think pair square and group investigation.

Keywords—problem solving ability; learning model think pair square; learning model group investigation

I. INTRODUCTION

The level of achievement of educational reform implementation and learning of mathematics can be seen through the achievement of learning objectives have been included in the content standards for elementary and secondary education units. One of the goals of mathematics lessons for SMP / MTs is that the students are able to solve the problem [1]. The ability of the intended above a mathematical abilities (mathematical power).Mathematical ability can be defined as "Mathematical power includes the ability to explore, conjecture, and reason logically; to solve non-routine problems; to communicat about and through mathematics; and to connect ideas within mathematics and between mathematics and other intellectual activity"[2].

Problem solving skills needed to train students to get accustomed to facing various problems in an increasingly complex life, not just a math problem itself but also to problems in other subject areas and problems in daily life [3]. The solution contains a four-step problem-solving solutions, namely: "(1) to understand the problem; (2) planning processes, (3) to solve the problem according to plan; and (4) checking back for all the steps that have been undertaken "[4]. Such measures are expected to help students in solving problems.

From the observation of fact the field stated that many students' difficulties in solving problems in the form of problem solving. It is known to investigators after giving the matter to the students. Students having difficulty in solving algebra problems especially on the material grade eight junior high school. Students have difficulty to find a solution. The results showed that of the 30 students who took the tests, only 26.6% or 8 people who pass, while 73.4% or 22 uncompleted.

In this issue the teacher should start using a model that can make the students active in learning, as it also is able to hone the skills of mathematical problem solving. One model of learning that involves the active participation of students is a cooperative learning model. Cooperative learning model gives students the chance to work together with other students in tasks in the system is structured and teachers act as facilitators [5]. The nature of the use of social and peer group becomes an essential aspect of cooperative learning [6].

Learning model used is cooperative learning model Think Pair Square and Group Investigation. In the learning model Think Pair Square "Think Pair Square is similar to Think Pair Share. Students first discuss problem-solving strategies in pairs and then in groups of fours. Since problem solving strategies can be complicated, this structure may be more Appropriate with experienced collaborative groups "[7].

While the cooperative model type Group Investigation (GI) is learning that emphasize the cooperation between
students in teams to do the investigation, collect information, analyze data, and make a CONCLUSION in which each member should contribute to the discussion so the group was able to clarify and synthesize all ideas [8]. Mathematics learning outcomes by using scientific investigation group learning model is better than the classical scientific model study [9].

Based on the background of the above problems, researchers interested in applying for a study entitled "Differences in Mathematical Problem Solving Ability Students Taught Model Cooperative Learning Think Pair Square and Group Investigation in junior high school".

II. METHODS

A. Population and Sample

The research was conducted in junior high school on Langkat. The reason for this is a site selection study for similar research has not been implemented at the school. The research was conducted in the first semester of the academic year 2017/2018 in class eight during the two meetings.

B. Research Design

The design of experiments in the study can be described in the following Table 1. [10]:

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Treatment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think Pair Square</td>
<td>X1</td>
<td>O2</td>
</tr>
<tr>
<td>Group Investigation</td>
<td>X2</td>
<td>O2</td>
</tr>
</tbody>
</table>

Description:
- O2: Posttest (final test capability solving the problem) is given treatment after
- X1: Treatment of cooperative learning model Think Pair Square
- X2: Treatment of cooperative learning model Group Investigation

1. Variables

Variables are the object of study, or what is the focal point of a study [11]. Variables in research among others; independent variable is the type of cooperative learning model Think Pair Square and cooperative learning Group Investigation, the dependent variable is the mathematical problem solving ability and variable attributes that students' motivation.

2. Research Procedure

Toin greater depth look at the research procedure can be seen in Figure 1. below.

III. RESULTS AND DISCUSSION

The primary objective of this study was to determine the differences between students' problem-solving abilities are given learning by using cooperative learning model Think Pair Square and cooperative learning model type Group Investigation.

A. Results Validation Assesment

Validated learning device includes lesson plan (RPP) and student activity sheets (LAS). Learning device validation results can be seen in Table 2 below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object Assessed</th>
<th>Value Validator</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Lesson Plan</td>
<td>4.46</td>
<td>Good</td>
</tr>
<tr>
<td>2.</td>
<td>Student Activity Sheet</td>
<td>4.42</td>
<td>Good</td>
</tr>
</tbody>
</table>

From Table 2 above shows the learning device can already valid

B. Results for Test Instruments

Results Summary validity, reliability, difference and difficulty index test mathematical problem solving ability of students can be seen in Table 3 below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Validity</th>
<th>Power Different</th>
<th>difficulty index</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Solving Ability Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>0.756</td>
<td>Valid</td>
<td>0.31</td>
<td>0.33</td>
</tr>
<tr>
<td>2.</td>
<td>0.883</td>
<td>Valid</td>
<td>0.29</td>
<td>0.37</td>
</tr>
<tr>
<td>3.</td>
<td>0.883</td>
<td>Valid</td>
<td>0.43</td>
<td>0.35</td>
</tr>
<tr>
<td>4.</td>
<td>0.836</td>
<td>Valid</td>
<td>0.32</td>
<td>0.4</td>
</tr>
<tr>
<td>5.</td>
<td>0.876</td>
<td>Valid</td>
<td>0.41</td>
<td>0.43</td>
</tr>
</tbody>
</table>
From Table 3 above shows that the test instrument used has met the criteria for the validity test, reliability test, the power difference and difficulty index grains question. It can be concluded that the test instrument to test the ability of mathematical problem solving can be used.

C. Normality and Homogeneity Test Results Problem Solving Ability
1. Test Normality
Normality calculation result postes problem solving skills mathematical Table 4 below:

Table 4. Normality Test Capabilities Troubleshooting

<table>
<thead>
<tr>
<th>Class</th>
<th>N</th>
<th>D₀</th>
<th>Dₐₜₐₓ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment I</td>
<td>32</td>
<td>0.139</td>
<td>0.240</td>
</tr>
<tr>
<td>Experiment II</td>
<td>32</td>
<td>0.118</td>
<td>0.240</td>
</tr>
</tbody>
</table>

Source: spss16.0 for windows

It can be seen from Table 4 above shows that the value of D₀ is 0.139 and 0.118 respectively less than Dₐₜₐₓ, then the data for the experimental class I and class II experiment normal distribution.

2. Homogeneity test
Results of homogeneity test can be seen in Table 5 below:

Table 5. Test Homogeneity of Problem Solving Ability

<table>
<thead>
<tr>
<th>Class</th>
<th>of Variance (s²)</th>
<th>F_count</th>
<th>F_table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment I</td>
<td>71.544</td>
<td>1.021</td>
<td>1.822</td>
</tr>
<tr>
<td>Experiment II</td>
<td>73.032</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: spss16.0 for windows

Based on Table 5 obtained that F_count amounting to 1.021 less than F_table, so that the sample is derived from data variance homogeneous group. Both sets of data experimental class I and class II experimental data have homogeneous variances.

D. Variance Analysis Two Paths
ANOVA Two Paths Calculation results for mathematical problem solving ability of students can be seen in Table 6 below:

Table 6. Test analysis of variance Two Line Troubleshooting Capabilities Problem

<table>
<thead>
<tr>
<th>Variants Source</th>
<th>JK</th>
<th>Db</th>
<th>RJK</th>
<th>F_count</th>
<th>F_table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Model</td>
<td>744.620</td>
<td>1</td>
<td>744.620</td>
<td>13.105</td>
<td>4.001</td>
</tr>
<tr>
<td>Students Motivation</td>
<td>390.063</td>
<td>1</td>
<td>390.063</td>
<td>6.865</td>
<td>4.001</td>
</tr>
<tr>
<td>Interaction Learning Model and Motivation</td>
<td>328.061</td>
<td>1</td>
<td>328.061</td>
<td>5.774</td>
<td>4.001</td>
</tr>
<tr>
<td>In</td>
<td>3409.194</td>
<td>60</td>
<td>56.820</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4871.938</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: spss16.0 for windows

Based on Table 6 above, the value of F₀ for learning model is 13.105, if the value of F₀ is in confirmation to the value of F_table at α = 5%, then F₀ is greater than F_table, 4.001. Concluded sufficient evidence to reject H₀. This means that there are significant learning model to the students’ problem-solving abilities. In other words, there are significant differences between cooperative learning model Think Pair square and cooperative learning model type group investigation in terms of problem-solving ability of students.

The calculation result analysis two paths toward students' scores on the learning model Think Pair cooperative type group investigation square and F values obtained, student motivation factor of 6.865 to F_table, 4.001. Because the F_count more than F_table, it can be concluded grouping students 'motivation also affects the students' problem-solving abilities.

For learning model factors related to student motivation acquired F₀, 5.774 to F_table, 4.001 then H₀ is rejected, which means there is no interaction between factors MBS model of learning by students against students' problem-solving abilities. This suggests that the cooperative learning model Think Pair Square and group investigation have an influence on problem solving ability of students, whereas if it is connected with the student's motivation was also influential in the problem solving ability of students.

IV. CONCLUSIONS
Based on the results of research and discussion can be obtained several conclusions as follows:
1. There are significant differences in the ability of students who are taught problem solving through cooperative learning model Think Pair Square with the students taught by cooperative learning model of Group Investigation.
2. There is interaction between learning models and student motivation toward differences in mathematical problem solving ability students.

REFERENCES
Learning Achievement Class XI student of SMK Negeri 2 Magetan, Yogakarta: Faculty of Science, University of Yogyakarta.


