THE EFFECT OF DISCOVERY LEARNING MODELS AND SOCIAL INTERACTION ON LEARNING OUTCOMES IN SUPPORT SOLUTIONS

Abstract

This study aims to determine the effect of discovery learning model and social interaction on learning outcomes in the buffer solution of class XI IPA SMA Hang Tuah Makassar. The population in this study were all students of class XI SMA Hang Tuah Makassar academic year 2016/2017 which consists of two classes with the number of students 67. Sampling by random class. Class XI IPA2 is taught by using learning discovery learning model (class experiment I) and class XI IPA1 which is taught by direct learning model (class experiment II). This research is a quasi-experimental research using 2 x 3 factorial design with data collection technique through social interaction questionnaire and learning result test. The data obtained were analyzed using descriptive statistical analysis and inferential statistical analysis using Two Way Anova with error rate 5% (α =0.05). The result of descriptive statistical analysis obtained the average value of learning outcomes of learners who were taught with discovery learning learning model higher than the direct learning model. The result of inferential statistic analysis shows that (a) there is influence of the discovery learning model on the learning outcomes in the buffer solution of class XI IPA SMA Hang Tuah Makassar; (b) there is an effect of social interaction on learning outcomes in buffer solution of class XI IPA SMA Hang Tuah Makassar; (c) there is no interaction between the discovery learning model and social interaction in influencing the learning outcomes in the buffer solution of class XI IPA SMA Hang Tuah Makassar.

Keywords: Discovery Learning, Social Interaction, Learning Outcomes
A. Introduction

Education has a very important role in all aspects of human life. Education is a vehicle to improve and develop human resources. The government realizes the importance of the process of improving the quality of human resources, so through the Ministry of National Education continues to strive to realize quality education as well as develop and improve curriculum and improve educational facilities and infrastructure. The curriculum can be viewed as a design, so the curriculum can determine the implementation, process and outcomes of education.

Curriculum 2013 which has implemented by the government since years 2013 ago, the number of high schools that have implement the 2013 curriculum 4,300 SMA (33.47%) spread across 34 provinces (Directorate of Senior High School Development, Directorate General of Primary and Secondary Education, 2016). School that hasn't implementing the 2013 curriculum still applies the 2006 Education Unit Level Curriculum (KTSP). The 2006 KTSP curriculum emphasizes the achievement of the competence of students both individually and classically. Student participation plays an important role in the success of learning. The teacher-centered learning paradigm is no longer relevant and must be changed into student-centered learning.

Hang Tuah High School Makassar still applying the KTSP curriculum 2006 using the method teacher-centered learning. Learning with teacher-centered methods is like a model Direct learning is still often used with considerations to be more practical and does not take up much time. Presentation of material is presented theoretically and students only listen to the delivery of the teacher.

Based on the results of observations made at SMA Hang Tuah Makassar at the beginning of the even semester of the 2015/2016 academic year, the average value of the completeness of the daily test scores on basic competencies describing the properties of the buffer solution and the role of the buffer solution in the body of living things in the 2015/2016 academic year is still low namely class XI IPA 1 of 51.2% and XI IPA 2 of 31.6% (Hang High School Administration Tuah Makassar).

Buffer solution is the material for class XI IPA even semester. The concept of a buffer solution is a complex concept. The concept of describing the properties of a buffer solution has a lot to do with the concept of acid-base solutions, reaction equations, chemical equilibrium. Students generally do not understand the reactions that occur in the buffer solution, as a result students cannot determine the properties of the buffer
solution themselves. Students tend to memorize reaction equations and chemical formulas of the substances involved in buffer solutions. The pH concept of a buffer solution applies a lot of complex mathematical calculations so that it requires students to think creatively in determining mathematical calculations.

The results of subsequent observations of students at SMA Hang Tuah Makassar in the learning process showed that social interaction between students was still low. This can be seen from the problem solving which is dominated by one person during the discussion, students are less interested in listening to the material presented and choose to tell stories with their friends.

Learners who don’t being trained to work together in groups causes social interaction in learning not to go well. Social interactions that do not go well can affect learning outcomes because during the learning process it requires good communication and social interaction between students and teachers (Khusnul L.N.S, Bakti Mulyani, and Sulistyo Saputro.2016).

Starting from these concerns, it is necessary to find alternative learning models that can be applied to improve the quality of learning and understanding the concept of buffer solutions. In the journal levels of inquiry, it can be seen that one of the learning models that emphasizes concept formation is the discovery learning model. The focus of discovery learning models emphasizes the formation of knowledge or concepts describing the buffer solution of the acid-base concepts they have studied previously (Carl. J. Wenning, 2011).

Discovery learning uses reflection as the key to understanding. Research by Widiadnyana I.W, Sadia I.W., and Suastra I.W. (2014) showed that there was a significant difference in understanding the concept of science between students who learned using the discovery learning model and those who learned using the direct teaching model ($F = 7,774; p <0.05$). The teacher introduces experiences in such a way as to increase relevance or meaning in using a sequence of questions during or after the experience to guide students to specific conclusions (Hadi Kurnianto, Mohammad Masykuri, and Sri Yamtinah. 2016).

According to Richard E. Mayer (2004) that discovery learning can be achieved, if students are given sufficient guidance for their cognitive activities so that they produce useful knowledge constructs. When students find something on their own, see something happen they can encode information in long-term memory visually and verbally (Jeanne E. Ormrod, 2009).
Based on the description above, can identify the possibility of the problem of lack of social interaction, the use of inappropriate learning models can be cause student learning outcomes tend to decline.

Based on the background which has been described, the title of this study is "The Influence of Learning Model Discovery Learning and Social Interaction on Learning Outcomes in Buffer Solution Class XI IPA SMA Hang Tuah Makassar"

B. Methodology

This research is a quasy experimental research conducted in the even semester of the school year 2016/2017, taking place at Hang High school Tuah Makassar. The population was class XI IPA2 taught using the discovery learning model(experimental class I) and class XI IPA 1 was taught using the direct learning(model experimental class II).

The variables in this study consisted of independent variables, namely discovery learning models, moderate variables, namely social interaction, and dependent variables, namely learning outcomes of students. The research design used was a post-test only control group design. The factorial design used is categorized as a 2 x 3 factorial design as in table 1.

<table>
<thead>
<tr>
<th>Social interaction</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)Model pembelajaran(B)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>A1B1</td>
<td>A1B2</td>
<td>A1B3</td>
</tr>
<tr>
<td>A2</td>
<td>A2B1</td>
<td>A2B2</td>
<td>A2B3</td>
</tr>
</tbody>
</table>

A = learning model  
A1= Groups of student who take part in learning use a learning model discovery learning experiment 1  
A2= Groups of student who take learning using a direct learning model(class experiment)  
B= social interaction  
B1= Groups of student who have high social interactions  
B2= Group of student who have social interaction  
B3= groups of student who have low social interaction

The instruments used were social interaction questionnaires and student learning outcomes tests. Observations were made by the observer. The steps for the implementation of this study began with the preparation of lesson plans and student worksheet learning
tools, giving social interaction questionnaires before treatment for group division. The learning outcome test is done at the end as a posttest. Process data, analyze and make conclusions.

Research data obtained in the form of social interaction data of students and data on student learning outcomes. Descriptive statistical analysis is used to describe the learning outcome scores obtained from each research group. Inferential statistical analysis

Descriptive Research Results used to prove the research hypothesis that has been proposed. The prerequisite test conducted is the normality test and homogeneity test using the SPSS 20 for windows application. The normality test was carried out by the One-Sample-Kolmogorov-Smirnov Test and the homogeneity test with the Two-Way Anova test with a significant level> 0.05. Hypothesis testing is done by using Two-Way Anova test using SPSS 20 for windows with a significant level of 0.05. If the price is significant (α) <0.05 then H0 is rejected and H1 is accepted and vice versa.

C. Findings and Discussion

1. Descriptive research results

<table>
<thead>
<tr>
<th>Descriptive</th>
<th>A_1</th>
<th>A_2</th>
<th>A_1 B_1</th>
<th>A_2 B_1</th>
<th>A_1 B_2</th>
<th>A_2 B_2</th>
<th>A_1 B_3</th>
<th>A_2 B_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>34</td>
<td>33</td>
<td>7</td>
<td>19</td>
<td>8</td>
<td>3</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Average</td>
<td>81.91</td>
<td>76.21</td>
<td>87.14</td>
<td>81.84</td>
<td>77.50</td>
<td>86.67</td>
<td>77.37</td>
<td>71.36</td>
</tr>
<tr>
<td>Std.</td>
<td>5.51</td>
<td>8.01</td>
<td>3.93</td>
<td>3.80</td>
<td>6.55</td>
<td>2.89</td>
<td>5.82</td>
<td>8.97</td>
</tr>
<tr>
<td>Range</td>
<td>20</td>
<td>35</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>5</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Min value</td>
<td>70</td>
<td>55</td>
<td>80</td>
<td>76</td>
<td>70</td>
<td>85</td>
<td>70</td>
<td>55</td>
</tr>
<tr>
<td>Max Value</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>85</td>
<td>85</td>
<td>90</td>
<td>85</td>
<td>85</td>
</tr>
</tbody>
</table>

A_1 = The learning outcomes of students who follow learning using discovery learning models

A_2 = The learning outcomes of students who take part in learning using a direct learning model

A_1B_1 = The learning outcomes of students who follow learning using discovery learning models that have high social interaction

A_1B_2 = The learning outcomes of students who follow learning using discovery learning models that have moderate social interaction
A1B3 = The learning outcomes of students who follow learning using discovery learning models that have low social interaction

A2B1 = Learning outcomes of students who follow learning using a direct learning model that has high social interaction

A2B2 = Learning outcomes of students who take part in learning using a direct learning model that has moderate social interaction

A2B3 = The learning outcomes of students who take part in learning using a direct learning model that has low social interaction

2. Pre-test requirements analysis

Table 3. Result of normality test for social interaction data and participant learning outcomes

<table>
<thead>
<tr>
<th>Group</th>
<th>Sig. interactions social</th>
<th>Sig. learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment I</td>
<td>0.060</td>
<td>0.037</td>
</tr>
<tr>
<td>Experiment II</td>
<td>0.052</td>
<td>0.264</td>
</tr>
<tr>
<td>Decision</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Table 4. Result of data homogeneity test students learning outcomes

<table>
<thead>
<tr>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.137</td>
<td>5</td>
<td>61</td>
<td>0.073</td>
</tr>
</tbody>
</table>

Hypothesis testing

Table 7. Summary of variance analysis test for chemistry learning outcomes

D. Conclusion and recommendation

Based on research results and the previous discussion, it can be concluded that

Conclusion:
1. There is a model influence discovery learning of results studied in a buffer solution for class XI IPA SMA Hang Tuah Makassar.

2. There is an effect of social interaction on learning outcomes in the buffer solution for class XI IPA SMA Hang Tuah Makassar.

3. There is no interaction between Discovery learning models and social interactions in influencing learning outcomes in the buffer solution for class XI IPA SMA Hang Tuah Makassar.

**recommendation:**

Through this research, several suggestions can be made as follows:

1. Learning by model discovery learning can be used as an alternative to improve learning outcomes.

2. Further research is expected to pay more attention to the initial abilities possessed by students.

3. The division of the group categorized into students who have high, medium and low social interaction, it is better if changes are made at each meeting.

4. Teachers are expected to be more creative in creating a conducive learning atmosphere.
E. References


