THE INFLUENCE OF GUIDED INQUIRY LEARNING METHOD WITH MACROMEDIA FLASH TOWARD STUDENT'S ACHIEVEMENT IN THE SOLUBILITY AND SOLUBILITY PRODUCT TOPIC

Yeni Purwati* dan Retno Dwisyanti2

1Guru SMP Swasta Perguruan Islam Amalia Medan
2Dosen jurusan Kimia, FMIPA Universitas Negeri Medan, Medan
*email : yenipurwati49@gmail.com


Kata kunci: Metode inkuiri terbimbing, Macromedia Flash, Kelarutan dan hasil kali kelarutan dan hasil belajar siswa

INTRODUCTION

Natural science has relationship with the way to find out about natural phenomena systematically, so natural science is not only a mastery of knowledge in the form of a collection of facts, concepts, or principles, but also in the process of discovery. Science education is expected to become a facility for students to learn about themselves, their environment, and also as a prospect for further development in applying it in the daily life. Its learning process emphasizes on the providing direct experience to develop competencies to make learners able to explore and understand about the scientific nature. Science education is directed to finding out and doing, so it can help learners to gain a deeper understanding about the natural surroundings (Tim Pendidikan Kimia, 2010).

The fact looks in the field about the science learning especially in chemistry, there are still taught with using learning model in one direction in which the role of teacher is still dominant. This is cause a lack of student interest and score that is achieved by students are less than what is expected. There is also find many learning model in chemistry that still using verbal learning. In the learning process, students are passive and just accept the knowledge from their teacher. This is has an impact on the weakness of students understanding in the basic concepts of chemistry.

The concept of solubility and solubility product is one topic in the chemistry which is quite difficult for students, so it require depth understanding in order to master this material completely. One alternative way that can be done to help students to understand about the concept of solubility and solubility product, the researcher interest to apply guided inquiry learning method with Macromedia Flash media.

32
Inquiry learning method is a series of learning activities that emphasize on the process of thinking critically and analytically to seek and find their own answer from a problem that is asked (Sanjaya, 2006). This method is expected can make students remember concepts longer since they have learn it because the concept is gained from the process of thinking critically and analytically to seek and find their own answer from a problem that will be solved.

Macromedia Flash is a combination learning concept with using audiovisual technology that can produce new features that can be used in educational sector. Teaching based on multimedia can present teaching material more interesting, not monotone and make easier to communicate it. Students can learn material individually with using computer that is has multimedia program. (Sarwiko, 2011)

The previous research that is relevant with this research had done by Aruan (2009) about the influence of the application of visual media on inquiry technique at solubility and solubility product constant (K_{sp}) to increase the student’s learning outcomes with the average of normalized gain in medium category with value of average gain for experiment class and control class is 0.42 and 0.35. From the different of normalized gain for both of classes, we can conclude that the application of visual media on inquiry technique give significant influence to increase student’s achievement. In the previous research that had done by Aruan, there is known the influence of visual media on inquiry technique, while for this research will be known the influence of guided inquiry learning method with using Macromedia Flash. This research different with previous research because in this research the inquiry that is used is focused on guided inquiry learning method and the learning media is Macromedia flash categorized as audio visual media.

**Methods**

This research was done in RSBI State Senior High School 2 Kisaran grade XI science program on February until March in the academic year 2011/2012. Population of this research is all of student grade XI science program in RSBI State Senior High School 2 Kisaran in the academic year 2011/2012. Samples of this research are obtained by choosing two classes randomly in school without consider achievement of students. From population, there is taken 2 classes as sample, one class will be made as experiment class (class that is given teaching with using guided inquiry learning method with macromedia flash media) and one class will be made as control class (class that is given teaching with using conventional method).

Dependent variable in this research is the student’s learning outcomes in teaching of solubility and solubility product topic. Independent variable are the applying of guided inquiry learning method with macromedia flash media in the experiment class, and applying conventional method in the control class.

<table>
<thead>
<tr>
<th>Class</th>
<th>Pre-test (X_1)</th>
<th>Treatment</th>
<th>Post-test (X_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>X_1 experiment</td>
<td>T_1 experiment</td>
<td>X_2 experiment</td>
</tr>
<tr>
<td>Control</td>
<td>X_1 control</td>
<td>T_2 control</td>
<td>X_2 control</td>
</tr>
</tbody>
</table>

Research design that is used for this research is experiment with two sample classes. Both of class, experiment and control class is given pre-test. Next, for experiment class is given teaching with using guided inquiry learning method with macromedia flash media while for control class is given teaching with using conventional method. After given different teaching treatment, for both of class sample is given post-test.

![Diagram](image-url)
Result and Discussion
The result of this research is obtained from the data of pre-test and post-test, and normalized gain both of group using statistic calculation by Microsoft Excel for Windows 2003. They are validity test, difficult level, different index, reliability test, homogeneity test, normality test, normalized gain, and hypothesis test.

a. Validity of Item Test
Validity test of research instrument is used to determine valid or not an instrument using formula of product moment with criterion if \( r_{\text{count}} > r_{\text{table}} \) at significant level \( \alpha = 0.05 \) therefore item test is called valid.

There are 35 items instrument test which is examined and after analysis is obtained 23 items are valid. They are number 1, 2, 3, 4, 5, 6, 7, 11, 12, 13, 14, 16, 18, 21, 22, 23, 25, 28, 29, 30, 32, 33, and 34. In this research only used 20 items in order to make it easier to be counted and has represented the indicators. The numbers of questions that are used as research instrument for this research are 1, 2, 4, 5, 7, 11, 12, 13, 14, 16, 21, 22, 23, 25, 28, 29, 30, 32, 33, and 34.

b. Difficult Index
Item test that has good criterion is an item test that is not too difficult or too easy. There are 35 items of instrument test which is examined and after analysis is obtained 1 item is difficult, 33 items are medium and 1 item is easy.

c. Different Index
Different index of item test is the ability of an item test to differ between clever student (has higher ability in learning) with stupid student (has lower ability in learning). There are 35 items of instrument test which is examined and after analysis is obtained 19 items are good, 1 items are enough, and 15 items are poor.

d. Reliability Test
There is obtained 20 items are valid, so it can be determined the reliability test which is aimed to know about reliability level of a research instrument. Reliability test is determined by using Kuder Richardson-20 (KR – 20) with criterion \( r_{\text{count}} > r_{\text{table}} \) at \( \alpha = 0.05 \). Based on calculation of reliability test is obtained \( r_{\text{count}} = 0.937 \) and \( r_{\text{table}} = 0.339 \). So, \( r_{\text{count}} > r_{\text{table}} (0.937 > 0.339) \). It means that research instrument which is used in this research is reliable.

Table 2. The Result of Hypothesis Test

<table>
<thead>
<tr>
<th>Sample</th>
<th>Class</th>
<th>Average and Deviation Standard</th>
<th>( t_{\text{count}} )</th>
<th>( t_{\text{table}} )</th>
<th>( \alpha )</th>
<th>Df</th>
<th>Description</th>
</tr>
</thead>
</table>

Figure 1. Flow Chart from Design of Research
Cognitive Aspect Improvement

The average gain from the level cognitive aspect which is improved by the implementation of guided inquiry learning method with macromedia flash media (experiment class) and implementation of conventional method and media (control class).

Table 3. Comparison of Average Gain from the Level of Cognitive Aspect in the Experiment and Control Class

<table>
<thead>
<tr>
<th></th>
<th>Average Gain from The Level of Cognitive Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1</td>
</tr>
<tr>
<td>Experiment class</td>
<td>0.7813 ± 0.0940</td>
</tr>
<tr>
<td>Control class</td>
<td>0.5894 ± 0.1124</td>
</tr>
</tbody>
</table>

Comparison The Average Gain From The Level of Cognitive Aspect

![Comparison The Average Gain From The Level of Cognitive Aspect](image)

Discussion

From data analysis show that student achievement using guided inquiry learning method with macromedia flash media is higher than using conventional method in the solubility and solubility product topic. The result data analysis of the average score in pre-test and post-test shows that there is increasing student’s achievement after giving teaching treatment with using guided inquiry learning method with macromedia flash media. It can be proved from the average value of pre-test in experimental class at RSBI State Senior High School 2 Kisaran is $(25.15 \pm 10.69)$, while in control class is $(24.41 \pm 9.60)$. While the average value of post test in experimental class at RSBI State Senior High School 2 Kisaran is $(83.97 \pm 6.00)$, while in control class is $(69.71 \pm 5.77)$.

Based on the average value of pre-test in experiment class and control class, it can be concluded that both of class have low achievement. While the average values of post test in experiment class and control class, it can be concluded that both of class have high achievement. Average score of student’s achievement in the experiment class with
using guided inquiry learning method with macromedia flash media is higher than using conventional method in the control class because guided inquiry learning method is a learning method that emphasize on the process of thinking critically and analytically to seek and find their own answer from a problem that is asked.

From the research result, the implementation of guided inquiry learning method with macromedia flash media are effective to increase students understanding about concept of solubility and solubility product that give effect in the increasing of student’s achievement.

Macromedia Flash is a program with the appearance of audio visual message clearer for students with various animation pictures that can stimulate student’s interest in learning. It can make the teaching material more interesting, not monotone, as well as a confusing concept can be understood easily with the help of macromedia flash for animation media that appear very attractive and easy to understand. Macromedia flash can help students to learn, organize and store the information in order to recognize immediately (perfect memory) for all desired. The using media in learning such as macromedia flash as audio visual media can increase student’s achievement.

The result of average gain from the level of cognitive aspect which is improved by implementation of guided inquiry learning method with Macromedia Flash media in experiment class is C2 (0.92, high category) and followed by C3 (0.84, high category) and C4 (0.74, high category).While the average gain from the level of cognitive aspect which s improved by implementation of conventional method and media in control class is C1(0.51, medium category) and C2(0.38, medium category). The level of cognitive aspects which is improved in the experiment class is C2 (comprehension), C3 (application) and C4 (analysis) while for control class is C1 (knowledge) and C2 (comprehension). It means that for this research implementation of guided inquiry learning method with macromedia flash media will give increasing to the level of cognitive aspect’s students in C2 (comprehension), C3 (application) and C4 (analysis). The implementation of conventional method and media (in this research using lecture method and Charta media) will give increasing to the level of cognitive aspect’s students in C1(knowledge) and C2 (comprehension).

Conclusion

Conclusion from the research result that was done are:

1. The student’s achievement in the experimental class that is taught using guided inquiry learning method with macromedia flash media is higher compared to the control class that is taught by using conventional method in the solubility and solubility product topic.

2. The cognitive aspect that is improved by the implementation of guided inquiry learning method with macromedia flash media is C2, C3 and C4. The average of normalized gain from the level of cognitive aspects is C2 (0.92, high category) and followed by C3 (0.84, high category) and C4 (0.74, high category).

References

Aruan, R., (2009), Influence Of The Application Of Visual Media On Inquiry Technique At Solubility And Solubility Product Constant (K_{sp}) To Increase Student's Learning Outcomes, Skripsi, FMIPA, Unimed, Medan.


Sanjaya, W., (2006), Strategi Pembelajaran Berorientasi Standar Proses Pendidikan, Kencana Prenada Media Group, Jakarta.

Sarwiko, D., (2011), Pengembangan Media Pembelajaran Berbasis Multimedia Interaktif Menggunakan Macromedia Director MX (Studi Kasus Mata Kuliah Pengolahan Citra Pada Jurusan S1 Sistem Informasi), Universitas Guna Darma, 1-12.


Sudjana., (2005), Metode Statistik, Edisi Keenam, Penerbit Tarsito, Bandung.


