

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

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Abstrak. Penelitian ini bertujuan untuk mengetahui hasil belajar siswa dalam topik kelarutan dan hasil kali kelarutan dengan menggunakan metode pembelajaran inkuiri terbimbing dengan Macromedia Flash media. Populasi penelitian ini adalah seluruh siswa kelas dua di RSBI SMA Negeri 2 Kisaran. Sampel adalah dua kelas yang dipilih dengan metode random sampling. Kelas eksperimen diajarkan dengan metode pembelajaran inkuiri terbimbing dengan Macromedia Flash media dan kelas kontrol diajarkan dengan metode konvensional. Instrumen penelitian adalah tes hasil belajar yang distandarisasi oleh validator ahli dan validitas empiris. Data dianalisis dengan Microsoft Excel untuk Windows 2003. Hasil tes distandarisasi dan diperoleh 20 butir soal yang valid dengan reliabilitas 0,937. Pengaruh metode pembelajaran inkuiri terbimbing dengan Macromedia Flash media untuk meningkatkan hasil belajar siswa diperoleh dari kemampuan siswa untuk menjawab pertanyaan-pertanyaan sebelum perlakuan mengajar (pre test) dan setelah perlakuan mengajar (post test) dan data yang digunakan untuk mengetahui gain ternormalisasi. Hasil penelitian menunjukkan bahwa data distribusi normal dan sampel homogen. Kelas eksperimen yang diajarkan dengan metode pembelajaran inkuiri terbimbing dengan Macromedia Flash media dapat meningkatkan hasil belajar siswa dalam kategori tinggi ($0.78 \pm 0,0940$) dan kelas kontrol yang diajarkan dengan metode konvensional dapat meningkatkan hasil belajar siswa dalam kategori sedang ($0.59 \pm 0,1124$). Analisis statistik menunjukkan $t_{hitung} (7.6454) > t_{tabel} (1.6593)$. Jadi, dapat disimpulkan bahwa hasil belajar siswa yang diajarkan dengan metode pembelajaran inkuiri terbimbing dengan Macromedia Flash media lebih tinggi dibandingkan dengan metode konvensional. Selain itu, aspek kognitif yang dikembangkan dengan penerapan metode pembelajaran inkuiri terbimbing dengan Macromedia Flash media adalah C2, C3 dan C4. Tingkat aspek kognitif adalah C2 (Pemahaman), C3 (Aplikasi) dan C4 (Analisis). Rata-rata gain yang ternormalisasi adalah C2 (0.92, kategori tinggi), C3 (0.84, kategori tinggi), dan C4 (0.74, kategori tinggi).

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 is 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.

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.

Methodes

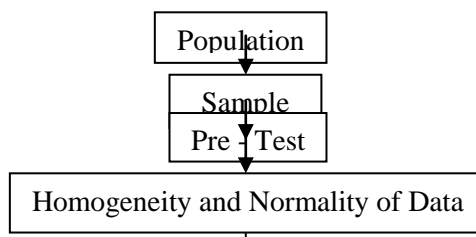
This research was done in RSBI State Senior High School 2 Kisaran grade XI science program on February until March in the academic year 2011/2012. Population of this research is all of student grade XI science program in RSBI State Senior High School 2 Kisaran in the academic year 2011/2012. Samples 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 1. Research Design

Class	Pre-test (X_1)	Treatment	Post-test (X_2)
Experiment	$X_{1 \text{ experiment}}$	$T_{1 \text{ experiment}}$	$X_{2 \text{ experiment}}$
Control	$X_{1 \text{ control}}$	$T_{2 \text{ control}}$	$X_{2 \text{ control}}$

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.



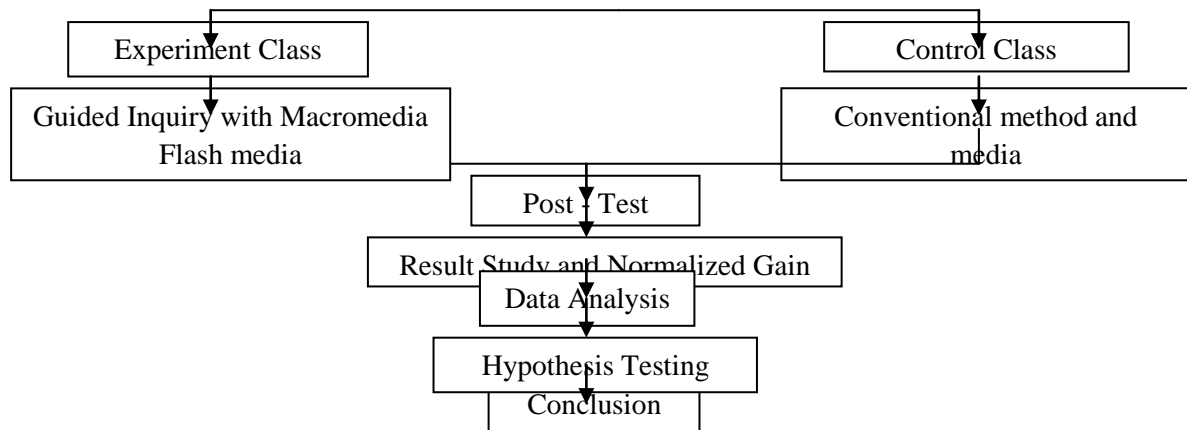


Figure 1. Flow Chart from Design of Research

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

Sample	Class	Average and Deviation Standard	t_{count}	t_{table}	α	Df	Description

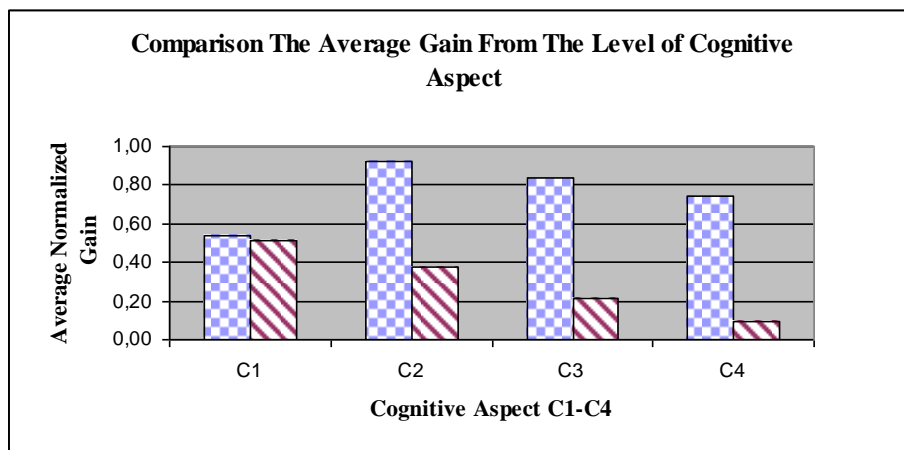
RSBI SMAN2 Kisaran	Experiment class	0.7813 ± 0.0940	7.645 4	1.659 3	0.0 5	66	refusing Ho receiving Ha
	Control class	0.5894 ± 0.1124					

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

Average Gain from The Level of Cognitive Aspect							
C1		C2		C3		C4	
Experimen t	Contro l	Experimen t	Contro l	Experimen t	Contro l	Experimen t	Contro l
0.54	0.51	0.92	0.38	0.84	0.21	0.74	0.09



Box shape (left side) = Experiment class
Line shape (right side) = Control class

Figure 2. Comparison of Average Gain from the Level of Cognitive Aspect in the Experiment and Control Class

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 ± 10.69), while in control class is (24.41 ± 9.60). While the average value of post test in experimental class at RSBI State Senior High School 2 Kisaran is (83.97 ± 6.00), while in control class is (69.71 ± 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 is 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).

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