

The Influence of the Learning Discovery Learning Model Multi-interactive Media Assistance Against Improved Learner's Critical Thinking Skills

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ABSTRACT

The 2013 revision curriculum is in attendance to enhance learners' critical thinking skills, but in reality the use of the learning model at school is still not appropriate. It aims to see the effect of discovery learning model multi interactive media assistance against increasing critical thinking skills learners on vector matter. The kind of research uses quasi experiment, with pre-test post-test control group design. The research is carried out in SMA Negeri 14 Jakarta odd semester on 2019/2020, with X MIPA 2 and X MIPA 3 as a sample each of which is made up of 36 learners. Using purposive sampling techniques. Instruments used to measure learners critical thinking skill it was on seven essay. Statistical analysis used was the Saphiro Wilk normality test that states normal data, homogenized tests that states both classes are in the same state. And then hypothesis test, that states the research shows that discovery learning model multi interactive media assistance can influence learner's critical thinking skills improving in SMA Negeri 14 Jakarta. As for the result it's a 0,84 with higher category of an increase in the experimental classes and 0,46 on with medium category on control classes.

Keywords: *Discovery learning, multi interactive media, critical thinking*

1. INTRODUCTION

Right now, in Indonesia applying the revision 2013 curriculum that has four major things on it. One of them in high level thinking skills (that is communication, collaboration, critical thinking and problem solving, dan creativity and innovation) it's supposed to answer the educational challenge of the industrial revolution. Results from a program called Programme for International Student Assessment (PISA) in the year 2015 state that, Indonesia has seen a low improvement by making fourth place in 72 countries within the advancement of learners. This is compared to the results of a 2012 survey (Ismail et al., 2018; Lastiningsih et al., 2017).

One of the best efforts you can make to improve your high-level thinking skills is to improve critical thinking skills of the learners (Aizikovitsh-Udi and Amit, 2011; Mumford et al., 2017; Pithers and Soden, 2000; Shamim, 2017). Critical thinking is directional clear-cut processes in activity solving problems, make decisions, persuade, analyze assumptions and do scientific research. Especially in areas that require

product knowledge, how to think, how to work and how to conduct scientific investigation like a physics lesson (Nadiya et al., 2016; Permana, 2018).

Judging from the results of the observations done in SMAN 14 Jakarta for three months, beginning from August to October 2018. Physics is considered one of the most difficult lessons. This is because: (1) the learning atmosphere was monotonous, (2) When teacher ahead, learners are less considerate, (3) When given training, learners tend to see the answers on the internet. Thus, in the day of the test, learners often find it difficult because of lack of sharpening their thinking skills. To improve learners critical thinking skills, there needs to be a change in learning style that can affect influences the process of learning to teach to better develop the critical thinking abilities of the learners (Krisdiana et al., 2019; Martyanti and Suhartini, 2018; Nurbaeti and Pursitasari, 2015). One possible efforts is to use the advocacy approach, open-ended problems, discovery learning model and multiinteractive media tool of learning

(Imswatama and Lukman, 2018; Ismaimuza, 2013; Ibrahim and Widodo, 2020). This model would invite learners to be able to identify the relevant issues of the material to be studied, then the learners is given the opportunity to gather credible information, then it worked into a temporary data that had to be verified and then a conclusion was drawn to serve as the general principle of the discussions.

From the exposure above, the author is interested in doing research using the title *The Influence Of The Learning Discovery Learning Model Multiinteractive Media Assistance Against Improved Learner’s Critical Thinking Skills*.

2. METHOD

The study took place at SMAN 14 Jakarta on. Sample for this research is X-Science 2 as an experiment class and X-Science 3 as an control class taken with purposive sampling technique. Here’s description of research design used table 1.

Table 1. research design

Group	Pretest	Treatment	Posttest
Exp	Y	X ₁	Y
Cont		X ₂	

Description:

Y : on essay

X₁ : treatment with the discovery learning model helping multiinteractive media

X₂ : treatment with a conventional model

In this study, each class was first given a pretest to determine the results of critical learners mental powers before getting treatment. In the experimental class applied by using discovery learning model helping multiinteractive media (macromedia flash and video), while in the control class applied conventional learning models assisted by powerpoint. After the number of meetings in the Learning Process Design (LPD) for vector material has been fulfilled, a posttest is conducted to see the effect of each learning model on the improvement of each student's critical thinking skills in both classes.

The data of this study are quantitative obtained from the results of the pretest, posttest, and the gain value which is then statistically analyzed using the t test, but previously conducted a normality and homogeneity test with the program help of SPSS 24.

3. RESULT AND DISCUSSION

The following is an illustration of the results of the control class and experimental class pretest presented in the form of a bar graph as follows.

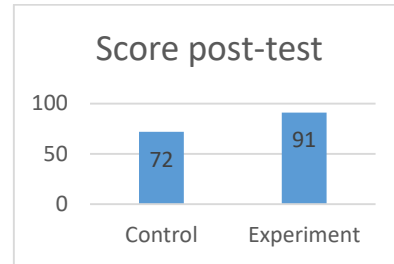


Figure 1: Average Results of Pretest Control Class and Experiment Class

From table 1, it can be seen that the average results of the pretest score in the control class and the experimental class do not differ much. This can also be seen from the results of the statistical data as in the following table.

Table 2. Results of Statistical Data Pretest Results of Control Class and Experiment Class

	Control	Experiment
N	36	36
Mean	46	41
Median	45	40
Standard Deviation	13.1	12.5
Minimum	20	22
Maximum	68	68

It is known from the results of table 1, that the statistical results of the average pretest value in the control class and the experimental class are only 5 digits. This indicates that both classes have the same ability, even though the results of the class average shows that the control class has a higher value than the experimental class.

Posttest Results of the Control and Experiment Class, the following are the average results of the posttest value of the control class and the experimental class presented in the form of a bar graph as follows.

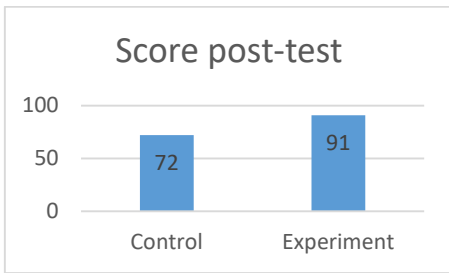


Figure 2: Bar Graph Gain Test Results for the Control Class and Experiment Class

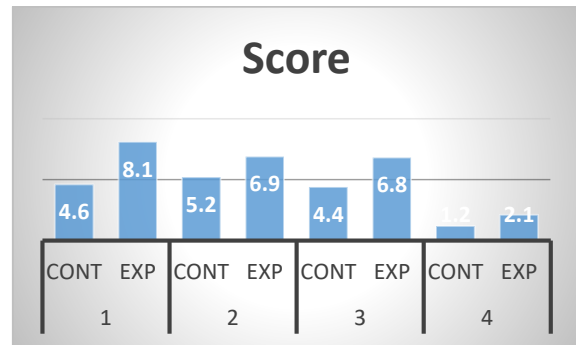
From picture 2 above it can be seen the results of the gain test in the control class and the experimental class are quite different. This can also be seen from the statistical data of each class presented in the following table 3.

Table 3. Gain statisticall

Gain	Control Class	Experiment Class
Minimum	- 0,15	0.30
Maximum	0,76	0.96
Gain	0,46	0,84
Category	Medium	High

From table 3 it can be seen that the average gain in the control class is 0.46 in the medium category, while in the experimental class it is 0.84 in the high category. This means that the effect of each learning model selection affects the increase in students' critical thinking skills and interactive multimedia-assisted discovery learning models can improve students' critical thinking skills. Nevertheless, there are still some students who fall into the medium category. This is because there are external variables that cannot be controlled while the research is ongoing, such as the mood of students in learning, the existence of school activities that require students to leave the classroom during class hours and the speed of students in working on the questions.

The same thing happened in the control class, so that the minimum gain value reached -0.15. The control class itself from the beginning has a higher ability than the experimental class, but the selection of lecture models makes some students unable to improve their critical thinking skills to the maximum. Because the control class that is obtained is different from the experimental class. Improvements to every aspect of critical thinking can be seen in the following bar diagram.

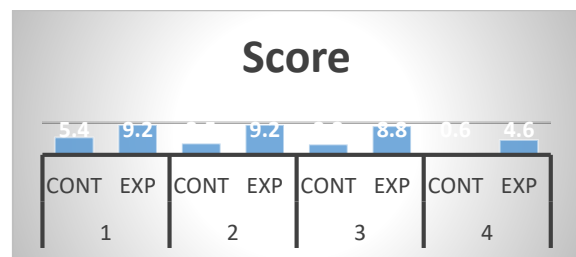


Note:

1. Aspect of Basic Clarification
2. Aspect of Giving reasons
3. Aspect of drawing conclusion
4. Aspect of futher axpation

Figure 3: Improvement Results on Each Aspect of Critical Thinking in the Control Class

In figure 3 is a picture of the improvement that occurs in every aspect measured from the results of the pretest and posttest of each student in the control class. The first aspect is basic clarification, where students have increased by 3.5. Then the second aspect is to give reasons for a decision with an increase of 1.7. The third aspect is to conclude, an increase of 2.4. The final aspect measured is further clarification with an increase of 0.9. It appears that the improvement that occurs in each aspect of the control class is not so high. This is because the use of lecture models, does not help students to practice their critical thinking skills. Because students only receive information and do not find it themselves. Especially in the aspect of further explanation, students cannot explain because of lack of understanding of vector material.



Note:

1. Aspect of Basic Clarification
2. Aspect of Giving reasons
3. Aspect of drawing conclusion
4. Aspect of futher axpation

Figure 4: Results of Improvement in Each Aspect of Critical Thinking in Experimental Classes

In figure 4, it is a picture of the improvement that occurs in each aspect measured from the pretest and posttest scores of each student in the experimental class. The first aspect is basic clarification, where students have increased by 3.8. Then the second aspect is giving reasons for a decision with an increase of 5.7. The third aspect is to conclude, an increase of 5.6. The final aspect measured was further clarification with an increase of 4. There was an increase in each aspect, much higher than the control class. This is because the use of discovery learning models train students to find concepts from the material being learned so that their thinking skills are trained. In addition, the presence of interactive multimedia such as Macromedia Flash and video can facilitate students in understanding the concept of vectors in everyday life. Especially in the aspect of giving reasons for a decision.

4. CONCLUSION

From the results of this study indicate that there is a significant influence of interactive multimedia-assisted discovery learning models on improving students' critical thinking skills in vector material at SMA Negeri 14 Jakarta. The increase in critical thinking skills by 0,84 with a high category in the experimental class, while in the control class by 0,46 with a moderate category.

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