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The Effectiveness Of Developed Lesson Plan Instrument On Subject Matter Life Organizations Towards Critical Thinking Skills

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Abstract: *Test result of the Organization for Economic Co-operation and Development (EOCD) (2015) showed that the result of critical thinking skills of Indonesian students are relatively low. The initial observation made by the researcher showed that students' low critical thinking skills at school is because the existing learning tools have not been able to facilitate students to develop their thinking skills, therefore it is necessary to develop lesson plan instruments that can facilitate the critical thinking skills. This study aims to improve students' critical thinking skills through the development of lesson plan instrument on life organizations subject matter by using guided inquiry models. This research was carried out in two stages namely the development stage which aims to develop lesson plan instrument following the 4-D design model from Thiagarajan (1974) it is also followed by the field testing with nonequivalent control group design. The subject of this research are seventh grade students of two schools, MTsN 1 (develovment stage) and MTsN 3 (Field testing stage) in Tabalong Regency. The lesson plan instrument is developed in this study to fulfill the eligibility requirements which are valid, practical and effective. The result of critical thinking skill both as a whole or when it is viewed by each used indicator in this study, namely interpretation, inference, analysis, evaluation and explanation, for the experimental class showed a higher increase than the control class. It can be concluded that the life organization learning material using the developed guided inquiry model have met the eligibility criteria and is able to improve the critical thinking skills of MTs students.*

Key words: *lesson plan instrument, life organization, critical thinking skills, guided inquiry.*

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I. Introduction

The results of test conducted by the Organization for Economic Co-operation and Development (EOCD) through the Program for International Student Assessment (PISA) (2015) showed that Indonesian science skills are still low. The latest result of PISA in the field of science, Indonesia are ranked 62 of 70 countries, with 403 achievement points. It is higher when it is compared to 2012 result which only got 382. Despite an increase, it is still below the average PISA standard (Kemendikbud, 2016). The low ability of science showed that Indonesian students' critical thinking skills were still relatively low.

Based on preliminary observations by conducting non-formal interview and observing the learning tools used by the teacher in teaching directly, the Lesson Plan (LP) used is still not in accordance with the standards set by the Ministry of Education and Culture (Kemendikbud). Teaching sources and students' worksheets used in the form of a thin book purchased from outside the school. Researchers saw that the questions compiled had not led to critical thinking skills. The average questions presented by the teacher has an operational word "specify", "who", and "write" so that students have not been facilitated to develop their thinking skills.

The above problems require a solution, then one of the ways that can be used to improve the critical thinking skills of students is to develop lesson plan instrument. The developed instrument must have a good category and are oriented towards thinking skills, especially students' critical thinking skills. The lesson plan instrument is claimed to be good if they meet the criteria valid, practical and effective (Supriyono et al. 2014).

The subject matter on life organizations in Learning integrated Natural Science in Junior High School is a conceptual learning which will produce theoretical knowledge if it is taught well. In teaching the material, the teachers has difficulty to connect the matter with the real world or to make it contextual. If this material is presented by using a Guided Inquiry model, then the students not only will acquire the concept of science but also develop thinking skills and a number of processing skills while also constructing their knowledge in life

(Kemendiknas, 2006). The development of learning tools using the guided inquiry model in the material is one way that might be used to achieve this goal.

Ningsih, et al (2016) in their reseach, reported that the application of guided inquiry-based practicum learning had an effect on students' critical thinking skills. Ajwar, et al (2015) in their research concluded the influence of guided inquiry model to students' critical thinking skills. Researcher can say there is a relationship between guided inquiry model with students' thinking skills based on the above research.

Researcher is interested in developing lesson plan instrument based on the description above. This development is conducted so that the students are able to develop their thinking skills. The author takes the title of the research: "The Effectiveness of Developed Lesson Plan Instrument on Organizational Life Subject Matter Using Guided Inquiry Models towards Critical Thinking Skills of MTs Students".

Based on the description above, the research question was answered about how the low critical thinking skills were caused by lesson plan instrument that were not good (valid, practical, and effective)?

II. Method

This research is a developed study using a 4-D model (Thiagarajan, et al 1974). The stages of this study consisted of the development stage (defining, designing, developing) and testing of products stage. The subjects of the research were students of class VII of the second semester at two schools, they were MTsN 1 and MTsN 3 in Tabalong Regency. The types of data which are the effectiveness indicators of learning tools include 1) Cognitive learning product measurement data, 2) Cognitive learning Process measurmen data, 3) Psychomotor assessment data, 4) Data on character behavioral assessment, 5) Data on social skills assessment, 6) Data from the assessment of critical thinking skills

The increased learning outcomes of knowledge and critical thinking skills were analyzed by using N-Gain. Researcher used is to find out the significance level of students' learning outcomes and critical thinking skills conducted by T-test. In addition to analyzing the results of the field test, covariance (Anacova) was also analyzed. This Anacova uses SPSS version 23. If the learning outcomes and critical thinking skills of the experimental class are better than the control class, it can be concluded that the tools meet the criteria for effectiveness.

the data from the assessment of spiritual, psychomotor, social skills, and behavioral characteristics of students were analyzed descriptively and measured by using the formula:

$$\text{Student score} = \frac{\text{Score obtained}}{\text{Maximum score}} \times 4$$

III. Findings And Discussion

The effectiveness data obtained from the field test is the result of cognitive product learning, the results of cognitive processing learning, the results of critical thinking skills, the results of social skills, spiritual and psychomotor attitudes. The results of the field test are presented in table 1 and table 2

Table 1 Cognitive Learning Outcomes and Critical Thinking Skills in the Field Test

Learning Result	*post test*		N-Gain		
	Experiment	Control	Experiment	Control	Sig.
Product Cognitive	78,18	40,06	0,72	0,22	0,000
Process Cognitive	81,84	56,19	0,74	0,37	0,000
Critical Thinking Skills Agregates	81,52	34,10	0,72	0,23	0,000
*Interpretation	80.46	47.62	0,60	0,21	0,000
*Analysis	74.71	47.92	0,64	0,26	0,000
*Evaluation	74.71	47.92	0,64	0,26	0,000
*Explanation	74.14	43.90	0,61	0,16	0,000
*Inferention	81.61	47.62	0,76	0,21	0,000

Table 2 Affective and Spiritual Learning Outcomes in Field Tests

Test Result	Average	Category
Psycomotor	3,64	Very Good
Spiritual	3,86	Very Good
Socaial Skill	3,79	Very Good
Character Behavior	3,91	Very Goog

The data in table 1 shows that most students improved their learning outcomes such as critical product, processing, and critical thinking skills. The mastery of concepts and critical thinking skills of students before and after learning can be known by calculating based on normalized Gain values based on Criteria N- Gain according to Hake (1999) is divided into three levels, namely: 1) Learning with "high gain", if (<g>)> 0.7; 2)

Learning with "medium gain", if 0.7> (<g>)> 0.3; 3) Learning with "low gain", if (<g>) <0.3. By the average N-Gain score results. While in the bigger experimental class than 0.7, so that it is categorized as high. While the N-Gain product cognitive and critical thinking skills were overall in the control class was smaller than 0.3 so it is categorized as low. As for the cognitive process, the control class is in the range of 0.3-0.7 so that it is categorized as medium. Critical thinking skills on each indicator had an average N-Gain score in the experimental class for indicators of interpretation, analysis, evaluation and explanation. Inference had a high category. N-Gain critical thinking skills in the control class all indicators used were in the low category.

ANACOVA shows that the cognitive significance of the product, process, and critical thinking skills had a difference posttest score, it is the difference between classes, the same thing also happens in post test from all indicators of critical thinking skills showed the difference of posttest score between classes for each indicator.

The data in table 2 showed the average assessment score of psychomotor, behavioral characteristics, social skills and spiritual attitudes. All of them have an average score above 3.33 in the very good category based on the Permendikbud criteria No. 81 A 2013.

IV. Discussion

The effectiveness of learning tools can be seen from the learning outcomes of cognitive products, cognitive process, learning outcomes, the results of critical thinking skills, the results of psychomotor assessment, the results of the assessment of spiritual attitudes, the results of the assessment of character behavior, and the results of character behavior assessment.

1) **Results of Critical Thinking Skills**

The calculation result of this study can be seen that N-Gain value of the experimental class is higher than the control class. Prasajo's research (2016) who developed a learning tools with an inquiry model with the aim of improving Science Process Skills (SPS) and critical thinking with junior high school subjects also showed that N-Gain of The experimental class was higher than the control class with the average N-Gain in the medium category. It made my research superior because the average N-Gain is in high category by the same indicator and category used in this research.

Based on the results of the research for each indicator, all N-Gain indicators were in the high category with average scores are in good category. These results were more detailed than Lestari A.'s research, et al (2016) with the same indicator showed average score that were categorized sufficiently without performing calculations on N-Gain and its significance.

These results indicate that the learning tools with a developed guided inquiry model can be said effective to students' critical thinking skills, in line with the research of Zaini (2016), Zaini, M; & Supiati (2017) and Azizah, et al (2016) who stated that the guided inquiry model effectively improves critical thinking skills.

2) Cognitive Learning Outcomes

The results of the study showed that the cognitive learning outcomes of the product and the experimental class process were higher than the control class. This result was reinforced by the research result of Vikagustanti.et al (2014), Jaya et al (2014) and Almuntasheri at al (2016) who found that the guided inquiry model can improve students' cognitive learning outcomes, but all these studies did not elaborate between the cognitive outcomes of products and cognitive process. Therefore the research that the writer did was more detailed because it separated cognitive product and cognitive process.

The results of the research by Fatimah, et al (2014) who developed learning tools using guided inquiry models also showed significant cognitive outcomes of products and processes. This is inseparable from the teacher's role in providing guidance and direction to students during the learning process so that guided inquiry learning can further improve the students' product cognitive learning and process cognitive learning outcomes.

Learning tools that had been developed by researchers had an influence on the learning outcomes of students' cognitive process postings. This indicates that the learning tools developed can be said to be effective in line with the theory proposed by Slavin (2009) that in the teacher learning process is expected to encourage students to focus on the thought process, take the initiative itself and be actively involved in teaching and learning activities.

3) Results of Psychomotor Assessment

The results of the field test in the experimental class and the control class can also be seen that the results of psychomotor assessment were very good. This is in line with Marneli's (2017) research that developed inquiry-oriented tools in the material of life organization showing excellent psychomotor categories. Inquiry-oriented learning is effective in fostering psychomotor learners in teaching and learning activities in the material of life organization.

The effectiveness of the devices that have been used along with the learning tools that is able to facilitate the analysis skills of students so that students are more skilled in solving problems related to the learning process. Zaini, et al (2017) explained that inquiry-based learning affected the ability to analyze and evaluate, and of course this will have an impact on psychomotor outcomes.

4) Results of Spiritual Attitudes Assessment

The spiritual attitude in this study is excellence categorized, meaning that the developed lesson plan instrument using a guided inquiry model is able to foster the spiritual attitude of students. This is in line with the research of Supiati (2015) who developed a lesson plan instrument with a guided inquiry model on the material of environmental pollution and showed that the spiritual attitude in the field test was categorized excellence. This spiritual attitude competence does not have basic material, therefore the basic competencies in the spiritual attitude group (KI-1) are not for students, because they are not to be taught and not to be memorized, but only as a teacher's guidance that in teaching a concept there must be spiritual messages and moral values contained in the material being taught.

5) Results of Social Skills Assessment

The results of the field test in the experimental class and the control class can also be seen that the results of the assessment of social skills are in very good category. This means that the developed lesson plan instrument can be said to be effective in fostering social skills of students in teaching and learning activities. Hidayati, et al. (2015) by using a guided inquiry model on energy material in life showed the average social skills for the same indicators as the author used (working together and expressing ideas / opinions) have very good categories.

6) Results of Characteristic Behavior Assessment

The results of the assessment in the field test are in very good category. This is in line with Jaya et al. (2014) who developed character biology learning tools with guided inquiry settings to improve the character and learning outcomes of junior high school students with the results of students' curiosity continuing to increase so that they were in good category. Guided inquiry has activities including observing, answering questions, studying books and other sources of information to see proven findings so that students' curiosity increases (Kuhlthau et al. 2005). Pluck & Hellen (2011) also argue that the curiosity of students can be increased by inquiry.

Indicators of good categorical responsibility were in line with the research of Hidayati, et al (2015) for the same indicators in his research showing very good categories in guided inquiry learning, meaning that the developed learning tools can be said to be effective in fostering the behavior of students in teaching and learning activities.

V. Conclusion

Thus this study shows that the low quality of learning devices is one of the factors that cause low critical thinking skills of students. By developing and using good learning tools (valid, practical and effective) the critical thinking of students has increased significantly.

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