Utilizing thematic maps to develop Indonesia natural resources analytical skills

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Abstract. Maps are one of the media and learning resources potentially to be used to develop analysis capability on Indonesia natural resources. The purpose of this study was to determine how providing map in worksheets can improve the capability to analyze natural resources potential. This study aimed to determine map influence on the ability to analyze natural resources potential. This research was a quasi-experimental study. The population in this study were all students of seventh grade on the one of State Secondary School in Cirebon City. The research sample was 83 students divided into two groups, 42 students as a control class and 41 students as an experimental class. Data collection was conducted through study documentation, worksheet result, and analytical skills assessment. The feasibility test result exhibited that providing maps on the worksheet is feasible to be used in the learning process. The experiment result exhibited differing ability to analyze natural resources through maps learning between control class and experimental class.

1. Introduction

One of the demands for character education in Indonesia is nationalism. A way to love the country is knowing the potentials of the country. Indonesia has rich and diverse natural resources that need to be loved by its people. The introduction to the potential of natural resources in Indonesia needs to be developed early. The most suitable subject for developing this content is social studies. The distribution of potential of natural resources contained in maps is very potential to develop higher-order thinking skills that can be done in social studies learning. Maps can develop complex cognitive skills [1], thereby it may also train the development of higher-order thinking skills.

Higher-order thinking skills (HOTS) is a demand in the 21st century. HOTS is required by students since it can help them generate ideas so that they can solve problems in learning or individual tasks [2]. Therefore, teachers must be able to construct learning affecting HOTS on the students as early as possible. HOTS is related to the cognitive domain, one of the indicators is analytical thinking skills. The analytical skills in the students can be measured in differentiating, organizing, and attributing skills [3]. Those three skills are developed as long as the teachers can stimulate those three skills through learning.

Social studies is an important part of the national education system in Indonesia. At the junior high school level, there are four objectives of social studies. First, introduction to the concepts of social life and its environment. Second, having the basic skills to think logically and critically, curiosity to solve problems in learning or individual tasks. Third, allowing students to develop higher-order thinking skills. Fourth, allowing students to learn about the development of the country.
problems, and skilled social life. Third, awareness of social and humanitarian values. Fourth, communication and collaboration skills [4]. Social Studies must at least contribute to the four aspects interpreted as the major goals of Social studies, which are (1) knowledge, (2) skills, (3) attitudes and values, (4) citizen action [5]. The meaning of “skills” is the higher-order thinking skills, including analytical skills. The poor standards of analytical skills are bad for the students, both for short and long terms. The short-term effect is the students’ learning outcomes that are far from learning. Meanwhile, the long-term effect is there will be no intelligence generation who give major contributions to the world since the people with excellent analytical skills will rule the 21st century [6].

The analytical skills emphasize on the material breakdown into more specialized or smaller parts and detect the relationships and its parts, then organize them [7]. The students who have good analytical skills can achieve good learning outcomes, while the students who have poor analytical skills will hinder their achievement of learning outcomes. Good or poor analytical skills can be seen from the elements that affect the students’ analytical skills.

Social studies learning as a system must be designed in such a way that the existing learning components are synergizing effectively to achieve learning objectives or nurturant effects of learning expected by the teachers. One of the important components in the learning system is the use of learning media. Media is one of the communication components as the messenger from the communicator to the communicant. The learning media is an aid in the teaching process to stimulate thoughts, attention, and learning skills so that it can encourage the learning processes or learning activities [8]. Therefore, the teacher is responsible for organizing the learning effectively. Teacher competence is interpreted by the mastery of tasks (teaching and educating), skill, attitude and appreciation needed to support the success of the educational process [9]. This includes skills in constructing learning media.

The learning media can improve students’ analytical skills since it is effective in learning. The effective planning model of the use of media in learning is called ASSURE. The ASSURE model is developed with six steps including analyzing students, setting learning objectives, choosing methods, using media and materials, involving students, and evaluating and revising [10].

The teaching materials are important to measure the students’ skills in understanding the contents of teaching materials. The teaching materials are a set of learning facilities or tools that contain learning materials, methods, to achieve the expected objectives, which is to achieving competence in all complexity [11]. The teaching materials can be used as learning guidelines for students to make it easier for them in learning.

One of the ways that can improve students’ analytical skills is using the learning media. The learning media in the form of maps can also improve the students’ learning outcomes. Map is a tool required to get the information on space [12]. The use of map in social studies learning is very effective. It makes the learning more meaningful since the students are actively involved in the learning process [13]. The map as a learning tool can help the teacher and students as well as facilitate the abstract learning into a concrete learning.

In addition as a learning media, the maps can also be transformed as learning resources since all the concepts contained in the maps are essentially learning messages that can be used as materials for the students to learn. “Map literacy model is a set of students’ learning activities patterns of a lesson that consistently use and utilize maps as a medium and learning resource designed to achieve certain instructional goals” [14].

In connection with the above matter, the researcher was interested to conduct a research on social studies learning by using media in the form of thematic maps. By using the thematic maps as the media, it is expected that it can offer a solution to increase the students’ passion for learning social studies especially to improve their ability to analyze Indonesia natural resources.
2. Methods

This research used experimental research method. The researcher used quasi experimental method. The research design was quasi experiment with nonequivalent Pretest-Posttest control group design. This design was almost the same as the pretest-posttest control group design with one type of treatment, except the experimental group and control group were not randomly selected [15].

| Table 1. Research Design |
|--------------------------|
| Group                    | Pre-test | Treatment | Post-test |
| A (Experimental Class)   | O₁       | Map Media | O₂        |
| B (Control Class)        | O₁       | Conventional | O₂ |

Description:  
A: Experimental Group/Class  
B: Control Group/Class  
O₁: Test before treatment  
X: Treatment  
O₂: Test after treatment

Based on the table above, before the treatment the control class and the experimental class were given pre-test to find out the initial state whether there was a difference between the experimental class and the control class. At the initial stage, the researcher made a map design that would be then validated by the teacher and experts using questionnaire to find out the validity of the media used for social studies learning.

The population in this research was all VIIth Grade students of SMPN 11 Cirebon of 414 students. The sample in this research was taken into two classes, namely the control class (learning by means of conventional method) and the experimental class (learning by means of learning media in the form of map). The samples were 83 students from the total number of VII-E and VII-G students.

In this research the data were collected through documentation study, media and worksheet validation questionnaire, and analytical skill test. The data were analyzed by using normality test, homogeneity test, and t (difference) test. The normality test was carried out on the pre-test and post-test data of the experimental class and the control class. The data normality test was conducted to determine whether the data obtained from each group of sample came from normally or not normally distributed population. The homogeneity test was used to determine whether the two classes, the experimental class and the control class, had the same variance or not. T (difference) test was carried out whether there were significant difference of mean from the post-test between the experimental class and the control class. In addition, the data analysis technique in this research used questionnaire analysis to determine the feasibility of the media and worksheet.

3. Results and Discussion

3.1 Results of Worksheet Expert Validation

The validation was carried out to determine the validity of media inserted in the worksheet. The following are the results of the worksheet feasibility validation by specialist and expert:
Table 2. Results of Worksheet Feasibility Validation

| No | Aspect                | Validator 1 | Validator 2 | ∑ | Conclusion     |
|----|-----------------------|-------------|-------------|----|----------------|
| 1  | Content Feasibility   | 86%         | 94%         | 90%| Very Feasible  |
| 2  | Language              | 84%         | 90%         | 87%| Very Feasible  |
| 3  | Presentation          | 100%        | 100%        | 100%| Very Feasible  |
|    | ∑                      | 90%         | 94%         | 92%| Very Feasible  |

Based on the results of validation by the specialist and expert, the validity was 92%, meaning that the worksheet made by the researcher was stated to be Very Feasible and could be used as a media as well as student worksheet that would be applied to the students in the experimental class. The worksheet feasibility was an evidence that the worksheet made by the researcher was suitable to be used for the research follow-up as worksheet on social studies material of The Potentials of Indonesia Natural Resources and Maritime.

3.2 Effects of Maps on Analytical Skill Level of Indonesia Natural Resources

This sub section explained the effect of the use of maps on the analytical skill level of natural resources. The t test was performed to find out the effect. The pre-requisite test was carried out before performing t-test calculation. The normality test was carried out by Shapiro Wilk test. Based on the results of normality test in the test of normality table above, the data of the experimental class showed that the significant value of Shapiro Wilk test was 0.016. Since the significant value was above 0.05, the data of the experimental class were normally distributed.

The next analysis was carried out through homogeneity test to find out whether the population had the same or different variance. The homogeneity test was carried out by Levene Test. The results of the homogeneity Laven Test revealed that the significant level or probability value was above 0.05. Since the significant value was > 0.05, the assumption of the normality of the experimental and control data was met. Then, the next step to find out the difference in the experimental and control scores was parametric testing, namely Independent Sample Test. The hypothesis for this test was formulated as follows:

H1: There is a Difference in Analytical Skill Level in Social studies Subject of VIIth Grade Students between Those Learning with and without Map Media.

Table 3. Results of T-Test in experimental class

|           | ∑     | T Value | Std Deviation | P Value | Conclusion     |
|-----------|-------|---------|---------------|---------|----------------|
| Pre-test  | 54.6341 | -22.706 | 9.04090       | <0.000  | Significant Difference |
| Post-test | 78.1707 |         | 8.34836       | 0.000   |                |

Table 3. explains the difference in the analytical skill level of the experimental class before and after the treatment or the pre-test and post-test data were tested. It was found that the P value of 0.000, meaning that it was smaller than 0.05. It could be concluded that there was a significant difference between the learning outcomes in the experimental class and the control class. From these results, it could also be concluded that the learning method by Thematic Map Media inserted in the worksheet could improve the results of analytical skills in social studies subject.

Based on the results of the calculation above, the difference in the analytical skill level between the experimental class and the control class by testing the N-gain data of the two classes revealed that the t count values of the experimental class and the control class were 6.204 and 6.186, respectively. It gave sig (2-tailed) value/P value of 0.000, respectively. Since the significant value was smaller than 0.05 and t count > t table, H0 was rejected, meaning that There was a Difference in Analytical Skill Level in
Social studies Subject of VIIth Grade students between Those Learning with and without Map Media. Thus, the map media affected the analytical skills of students of SMPN 11 Cirebon. From the average value, the Analytical Skill Level in Social studies Subject of VIIth Grade students between Those Learning with Map Media was better than Those Learning without Map Media.

### Table 5. Results of n-gain t-test of experimental class and control class

| Class         | N-Gain | T Value | Std Deviation | P Value | Conclusion     |
|---------------|--------|---------|---------------|---------|----------------|
| Experimental  | 0.5294 | 6.204   | 0.15211       | 0.000   | Significant Difference |
| Control       | 0.3435 | 6.186   | 0.11932       |         |                |

Based on the learning outcomes of the control class and the experimental class and from the average of overall data, the gain value of the control class was 0.34 while the gain value of the experimental class was 0.529 or 0.53. As a result, when comparing those two, there was a difference in the increase in analytical skills where there was an increase in the control class of 0.34 or 34% with moderate category and an increase in the experimental class of 0.53 or 53%. It mean that the experimental class had a higher increase in analytical skills compared to the control class.

### Table 6. Recapitulation of results of n-gain of experimental class and control class

| Class   | Gain Index Criteria of Each Student | Σ Gain Index Criteria |
|---------|-------------------------------------|-----------------------|
|         | Low (F) | Moderate (F) | High (F) |
|         | Percent | Percent | Percent |
| Experimental | 2 (5%)   | 33 (80%) | 6 (15%)  | 0.529 | Moderate |
| Control  | 15 (36%) | 27 (64%)  | 0 (0%)   | 0.344 | Moderate |

Based on the table above, the results of the normalized gain index analysis in the experimental class showed the low category of 2 students (5%), the number of students included in the moderate category was 33 students (80%) and those included in the high category was 6 students (15 %). The increase in the average normalized gain index from pre-test to post-test was 0.529 with the Moderate category.

On the other hand, the gain value in the control class showed the low category of 15 students (36%), the moderate category of 27 (64%) and there were no students who obtained the high category. The increase in the average normalized gain in index from pre-test to post-test was 0.343 with the moderate category.

Based on the table 6, the researcher could analyze that the data on the results of the students’ learning outcomes in the experimental class were higher than the students’ learning outcomes of the control class since the average scores of the students’ learning outcomes in the experimental class was 0.53 or 53% while in the control class was 0.34 or 34%. Consequently, it was proven that the average score of the experimental class was higher than the average score of the control class that tended to increase slightly.

Based on this research, it proves that maps can significantly improve the cognitive skills [16]. Moreover, student-centered learning with a constructivist approach as performed in this social studies learning is excellent to develop students’ cognitive skills, especially the high level skill [17][18]. The quality worksheet will be able to help the students solving the problems [19], which is the part of 21st century skills [20].

### 4. Conclusion

Based on the results of the research and discussion, here are the conclusions: First, based on the results of specialist and expert validation, there was a feasibility of the validation results. The results revealed that the feasibility and validity reached 92%, meaning that the map media prepared by the researcher was stated to be very feasible and could be used as a media and for student worksheet that could be
applied to the students of the experimental class. The worksheet feasibility was an evidence that the worksheet was suitable to be used for research follow-up as worksheet on social studies material of The Potentials of Indonesia Natural Resources and Maritime.

Second, based on the results of the experimental class and the control class, there was a difference in the analytical skills of the experimental class which was using the map media inserted in the worksheet (LKS) with the control class which was using conventional method. Based on the comparison of n-gain criteria between the experimental class and the control class, the researcher could analyze that the results of the students’ learning outcomes in the experimental class increased more than that of the control group since the average score of the students’ learning outcomes of the experimental class was 0.53 or 53% while the average score of the students’ learning outcomes in the control group was 0.34 or 34%. As a result, it was proven that the average score of the experimental class was higher than that of the control class that tended to increase slightly.

Third, based on the results of t (difference) test, the map media inserted in the student worksheet affects the analytical skill level on social studies Subject of VIIth Grade students. It was proven from the results of the calculation of statistical tests stating that there was a difference in the analytical skill level on social studies Subject of VIIth Grade students between those learning with and without map media. Therefore, the map media affects the analytical skills of the students of SMPN 11 Cirebon.

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