

THE EFFECTIVENESS OF ROLE-PLAYING SIMULATION METHOD IN FLOOD DISASTER EDUCATION FOR SOCIAL SCIENCE LEARNING

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THE EFFECTIVENESS OF ROLE-PLAYING SIMULATION METHOD IN FLOOD DISASTER EDUCATION FOR SOCIAL SCIENCE LEARNING

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ABSTRACT

The purpose of this study was to determine the effectiveness of using the role-playing method of flood disaster in increasing the knowledge of social studies learning students and knowing the attitudes of students in the face of flooding. The samples used were total sampling techniques, the samples taken were Class VIII A, class VIII B. The method of data collection in this study was carried out in three ways, namely tests, questionnaires, and documentation. The data analysis technique uses t and n-gain tests. The results showed that the use of the experimental class simulation method was more effective than the control class discussion method. The level of effectiveness of learning outcomes by using the t-test shows the average value of the control class pre-test 57.9, and the post-test control class 67.4 based on the n-gain test the increase in learning outcomes in the control class is low with the number 0.225.

INTRODUCTION

Indonesia is located between 6° North Latitude to 11° South Latitude and 95° East Longitude to 141° East Longitude. It has a tropical climate, and experiences two seasons in a year, summer and rainy season. However, the intensity of the two seasons in each region and each island is different. It depends on the location of the area to the longitude position of an area. The areas that have a great intensity of rainfall are the western islands of Indonesia, including Sumatera, Kalimantan, and Java. The high intensity of rainfall in the islands causes sever-

al areas to be frequently hit by flood disasters during the rainy season, especially the flood-prone area. Some examples of the flood-prone areas are the areas around rivers (banks), barren mountains, and the coastal areas. (Saptono, 2007: 35).

Central Java is one of the areas that have high disaster risk with various characteristics. Natural disasters often occur in Central Java, including earthquakes and tsunamis in the southern part of Central Java. Flood usually occurs in the northern coast area (Pantura), and landslides often occur in the central part of the Central Java region

(Suharini, 2013: 1).

At the beginning of 2014, the occurrence of flash flood disaster spread in Central Java, one of which was in the Welahan Sub-district area. Welahan is one of sixteen sub-districts in Jepara Regency. Welahan District has an altitude of 2 to 7 meters above sea level. With relatively flat topography and traversed by a large river, this district has a high threat to flooding. The biggest threat of flooding in Welahan is experienced by Welahan Village and Singilelo Ketileng Village, which are located on the edge of the Wulan River. Both villages experienced flash floods from 23 to 29 January 2014 due to the overflow of the river caused by the high intensity of rainfall. At the peak condition of flooding (25 January 2014), the number of refugees at the flooding post in the Welahan Sub-district reached the number of 14,896 people (Aji, 2015: 3).

MTs Darul Istiqomah is one of the schools in Ketilengsingolelo Village, Welahan, Jepara, which was affected by flash floods 23 to 29 January 2014. The flood disaster may reoccur at the school because it is located in the flood-prone area. Students at MTs Darul Istiqomah also reside in other areas of potential floodings, such as Paren, Kuanyar, Kalipucang Wetan, and Gedangan village.

The Indonesian Disaster Education Consortium (2011), states that schools are the basis of a children's community. They are the parties that must be protected, and at the same time, their knowledge of disaster needs to be increased. School is an effective vehicle in providing the effects of information, knowledge, and skills to the nearest community. Thus, disaster education activities in schools become an effective, dynamic, and sustainable strategy as an effort to spread disaster education. Systematic, measurable, and implementation efforts in increasing the

ability of school residents will undoubtedly be able to reduce the impact of disaster risk in schools. In achieving the learning objectives by aiming at the knowledge and skills of the students regarding disaster preparedness, it will be developed into a flood disaster simulation learning method.

In the context of learning, the simulation method is a teaching technique used by the teacher in presenting subject matter. It is done by conditioning the students to demonstrate certain skills, as is the case in the real-life world. In connection with that, Syaiful Bahri Djamarah explained that: "simulation learning method is a way of presenting lessons by demonstrating or showing students a certain process, situation, or object being studied, both actual and artificial which is often accompanied by oral explanations (Bahri, 2006: 90).

MTs Darul Istiqomah uses the 2006 curriculum. In achieving the learning objectives, the researcher includes the simulation method in natural disaster preparedness material in basic competency 1.3. The basic competency describes the environmental problems and efforts to overcome them in the sustainable development of natural disaster preparedness material.

The problems examined in this study are, 1) How is the effectiveness of flood disaster simulation methods in increasing students' knowledge in social studies learning in MTs Darul Istiqomah about flooding? 2) How is the students' preparedness action in facing the floods?

The objectives to be achieved in this study are (1) to find out the effectiveness of the use of flood disaster simulation methods in increasing the knowledge of social studies learning for students in MTs Darul Istiqomah; (2) to find out the students' preparedness action in dealing with the floods.

METHOD

The purpose of this study was to (1) to find out the effectiveness of the use of flood disaster simulation methods in increasing the knowledge of social studies learning for students in MTs Darul Istiqomah; (2) to find out the students' preparedness action in dealing with the floods.

Sample and Data Collection

The location of this research is MTs Darul Istiqomah Jepara. Administratively, MTs Darul Istiqomah Jepara is located in Ketilengsingolelo Village, Welahan, Jepara. The research was carried out, starting from 15 to 22 October 2018. This research used Quasi-experimental design research. The populations in this study were the students of grade VIII MTs Darul Istiqomah in the academic year of 2018-2019 with 20 students from class A and 20 students from class B. This study used a non-probability sampling technique, and saturated sampling techniques or total sampling which is the determination of the sample where all members of the population are used as samples.

The research variables discuss the effectiveness of the use of simulation methods and students' preparedness action in dealing with the floods. The data collection techniques used were tests used to measure the cognitive aspects or understanding of students in the experimental class and the control class, questionnaire to determine the level of preparedness of all students of grade VIII, the documentation in this study in the form of a history of flood disasters in Welahan during 2014 to 2017, flood-prone disaster maps of Welahan Sub-district, students data, and school profiles.

Analyzing of Data

The data that have been obtained are analyzed by descriptive percentages and the average difference test or t-test to test the hypothesis.

FINDINGS AND DISCUSSION

This research was carried out at MTs Darul Istiqomah, located in Ketilengsingolelo Village, Welahan, Jepara. The location of MTs Darul Istiqomah is astronomically located at 6 ° 46'.30" South Latitude and 110 ° 44'0" East Longitude. Administratively, the boundaries of Ketolengsingolelo Village in Welahan Subdistrict are as follows: in the north it is bordered by Kalipucang Wetan Village. In the east, it is bordered by Welahan Village, in the south by Gedangan Village, and in the west by Paren Village.

Implementation of the Flood Disaster Simulation Method for the Experimental Class

The implementation of the learning process in the experimental class was carried out in class VIII A. The learning process in the experimental class was carried out by using the material simulation method prepared for flood disaster. It was carried out within 3 hours of study or one meeting with a time allocation of 125 minutes.

The lesson began with the introduction of students with researchers as the deliverer of material. Then the researcher explained the learning activities that will be delivered using a simulation method. After that, the researcher guided the students to convey their respective roles.

Before the lesson began, the researcher distributed the Pre-Test questions that had been prepared beforehand. The aim is to measure students' knowledge before being treated by using a flood disaster simulation method on flood disaster preparedness material. In this learning, first, the teacher said that they would use the flood disaster simulation learning method. It is the method of learning to play a role as if the flood happened. The researcher provided an overview of flood disaster mitigation. After the re-

researcher gave an introduction, the students filled out the Pre-Test questions.

The researcher provided the opportunity for students to ask questions especially to students who were involved in the simulation role. The question is in the form of what disaster happened in the neighborhood. The question intended to encourage students to find out what and how they understood things that had to be done related to natural disasters. It would ultimately leads to the concept of mitigation.

The simulation started to be played by the cast group. The other students followed attentively, and then the researcher gave help to the cast who was having difficulty. The simulation was stopped at peak time. This is intended to encourage students to think in solving problems that were being simulated.

At the end of the study, the researcher directed the students to have a discussion about the simulation and the simulated story material. The researcher encourages students to provide criticism and responses to the process of implementing the simulation. Then, they had to formulate the conclusions.

The researcher and students reflected on the learning activities and the results of learning that had been carried out. The reflection was carried out at the end of the meeting, and the teacher held a Post-Test to find out student learning outcomes after the learning was carried out. Then, the researcher distributed questionnaires to find out how students' interests and responses to the implementation of learning with the simulation method.

The Implementation of Learning in Control Class

The learning process in the control class was using learning discussion methods. The researcher did not use flood disaster simulation on flood disaster preparedness material in class B. It was conducted within

3 hours of study or one time meeting with an allocation of 45 minutes every one hour meeting. The implementation of learning in the control class that was not given treatment with a flood disaster simulation was class VII B with a total of 20 students. The learning activity was carried out at 11:45 on Monday.

The lesson began with the introduction of students with researchers as the deliverer of the material. Then, the researcher explained the learning activities that would be carried out. Before the lesson began, the researcher distributed the Pre-Test questions that had been prepared beforehand. It was intended to measure students' knowledge before the material was delivered.

Table 1. The Pre-Test Results of the Experimental Class and Control Class

Description	Experimental Class	Control Class
Number of Students	20	20
Average	59.5	57.9
Highest Score	80	76
Lowest Score	40	48
Total of Completeness	3	2

Source: Research Data, 2018

In this study, first, the teacher said that he would use the discussion learning method. It is a learning method that exposes students to a problem. The main purpose of this method is to solve a problem, answer questions, add and understand student knowledge, and to make decisions. The researcher provided an overview of the flood disaster mitigation. It started with essential questions.

Students were asked to read textbooks about the types and characteristics of natural disasters, and the distribution of areas prone to natural disasters in Indonesia. Then, the students were asked to observe a video from

BNPB relating to the risk reduction of floods. After watching the video shown, the students could understand the risk reduction of floods. The researcher divided students into 3 discussion groups. Group 1 discussed about the pre-disaster activities in the school area, Group 2 discussed about the activities that had to be done when a school disaster occurred, and Group 3 discussed about the post-disaster activities. The students also had to ask questions to other groups. The researcher encouraged students to provide criticism and responses to the process of implementing the simulation. Then, they had to fill the post-test and questionnaire.

The Effectiveness of Using the Flood Disaster Method

Learning outcomes are things students get after learning. In this study, the pre-test results of the experimental class and the control class could be seen in table 1. Based on Table 1, it could be seen that the pre-test result in the experimental class shows an average of 59.5, with the highest score of 80 and the lowest score of 40. While the average of the control class is 57.9, with the highest score of 76, and the lowest score of 48. From the data, the experimental class has 3 students who passed the minimum criteria in completion, while the control class is 2 students. The pre-test results are used to determine the students' initial abilities before being treated in the form of learning.

The normality test data on pre-test of the experimental group and the control group that has been summarized obtained a value of χ^2 count $<$ χ^2 table = 9.49 for $\alpha = 5\%$ with $dk = 4$. The normality test for the post-test data of the experimental class and the control class that have been summarized obtained the value of χ^2 count $<$ χ^2 table =

9.49 for $\alpha = 5\%$ with $dk = 4$. Thus, it could be explained that the pre-test and post-test data in the experimental and control groups are normally distributed.

The learning outcomes could show how students' understanding of the material provided. This study is conducted in the experimental class and control class that intended to determine the effectiveness of the implementation of the use of flood disaster simulation method. To find out the effectiveness of the learning model, the researcher uses a post-test. Post-test is given after the implementation of learning with the learning model of flood disaster simulation. The following are the results of the post test of the experimental class and the control class that could be seen in table 2.

Table 2. The results of post-test of the experimental class and the control class

Descriptions	Experimental	Control Class
	Class	
Number of Students	20	20
Average	81	67.4
Highest Score	92	84
Lowest Score	72	56
Total of Completeness	20	10
	100%	50%

Source: Research Data, 2018

Based on Table 2, it could be seen that the learning outcomes of post-test in the experimental class shows the percentage of completeness of 100% with the number of students who completed as many as 20 students from the total of 20 students. The average score is 81 with the highest score of 92 and the lowest score of 72. While in the control class, the percentage of completeness is 50% with the number of students who complete as many as 10 students out of 20 students in total. The average score is 67.4, with the highest score of 84 and the lowest score

of 56. The results of the post-test scores indicate an increase in student learning outcomes after receiving learning treatment where many students could pass the minimum criteria in completion.

In the experimental class, by using the flood disaster simulation method, the learning outcomes of students' post-test have reached classical completeness. More than $\geq 75\%$ of students have achieved the Minimum Criteria in Completion (KKM), which is 65. From learning by using flood disaster simulation method, it gives students more opportunities to fulfill their curiosity about new things. In addition, students feel more interested in social studies, thus fostering enthusiasm for learning and providing maximum results.

Based on the calculation of t arithmetic = 6.889 and has a value above t(0.95) (58) which is 2.02. Since t arithmetic is in the rejection region H_0 , it can be concluded that the average of experimental class is better than the average of control class. The magnitude of the effect on the flood disaster simulation method on learning outcomes is measured by using the N-gain test. Based on the N-gain test, the result is 0.522, and included in the medium category.

The Level of Students' Preparedness in Facing Flood

The results of the level of students' preparedness in facing flood in learning activities could be seen in the following table 3.

The level of preparedness for VIII grade students of MTs Darul Istiqomah is included in the ready criteria. It is based on the reference mode which shows that the most frequency is the data of students who are included in the ready criteria with a frequency of 22 students or 55% out of 40 students. These results indicate that students of class VIII MTs Darul Istiqomah have

good preparedness knowledge. It could be known by students being able to understand the characteristics of flood disasters, understanding geographical conditions and disaster vulnerabilities in the student's residence environment, and can understand efforts to prevent and mitigate flood disasters. Students also have a good attitude of preparedness. This is indicated by the answers of students who show that students have concern about the vulnerability and risk of flood disasters, have a desire to get information and knowledge about flood disasters, and have sensitivity to flood disaster mitigation efforts.

Table 3. Student readiness level

Interval	Freq	Criteria	(%)
80-100	15	Very ready	37.5
59-79	22	Ready	55
39-58	3	Poorly prepared	7.5
17-37	0	Not ready	0

Source: Research Data, 2018

The Student Activities with Simulation Methods

The results of student activities in learning process could be seen in table 4 below.

Table 4. The results of student activities in learning process

Interval	Fre	Criteria	(%)
	9		
52-64	2	Very active	10
40-51	14	Active	70
28-39	4	Moderately active	20
16-27	0	Less active	0

Source: Research Data, 2018

The overall average variable of student activity in the simulation method amounted to 44.84 and included in the active criteria. This is supported and strengthened by the mode which shows that the highest frequency is student data that is included in the active criteria of 14 students or 70% out of 20 students. These results indicate that students actively pay attention when the researcher gives direction, students pay close attention and respond when given direction by the researcher. Students are also active in observing the performance of researchers. This is indicated by students actively paying attention, listening, and noting important points of messages conveyed by researchers. It could maintain calmness and focus in learning. Students are also active in discussing role groups. It could be seen by students actively asking questions about things they do not understand. They also able to express their ideas, exchange opinions, appreciate when other friends express opinions, want to find other learning resources needed, and are able to complete the tasks given. Students are also active in presenting reports on the results of role group discussions. They use good spoken language and can draw conclusions correctly.

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CONCLUSION

Based on the results of the analysis and discussion ⁶ the research results that has been done, it can be concluded that: 1) the implementation of learning using the flood disaster method is going well. The effectiveness of the use of learning models for the flood disaster simulation method is effective. This is indicated by the average value of the learning outcomes of post-test and the completeness of the minimum criteria (KKM) of the experimental class. It is better than the average scores of the learning outcomes of post-test from the control class. The t-test

results also ⁴ show that there are differences where the experimental class is better than the control class. The results of the *N-gain* test also showed that there was an effect that was classified as the medium category compared to learning using the discussion method. This can be interpreted that the use of flood disaster simulation learning methods is effective against the results of social studies learning material prepared for natural disasters. 2. The level of preparedness of Grade VIII students at MTs Darul Istiqomah in dealing with floods after learning with the flood disaster simulation method is included in the ready category. This means that students have good knowledge and preparedness in facing floods.

SUGGESTIONS

The researcher suggests that the students need to be guided, directed, and given the understanding that even though it is not in the real situation, it must still be considered carefully. This needs to be considered so that student activities in the simulation method can be improved. Other researchers can expand the variables of disaster preparedness in this study. It could show other factors that are thought to have an impact on the level of student preparedness in facing disasters.

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