Increase the awareness and response of disaster by using kamishibai learning method on social studies at junior high school

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Abstract. Increase the awareness and response of disaster is an important thing which students must have in facing every types of disaster that occurs in surrounding environment. Kamishibai learning method is a method that use picture technique to give information and description about certain phenomena. The usage of Kamishibai learning method especially in sub material of Indonesian Nature Condition on Social studies need to be increased in an attempt to give student awareness in facing disaster. Therefore, it was conducted a research of Kamishibai learning method to increase awareness and response of disaster in SMPN 1 Lembang class VII. This research was using one group pretest-posttest design. Research result shows that Kamishibai method has a strong influence towards an attempt to increase the awareness and response of disaster, but the knowledge of disaster is still relatively low.

1. Introduction

Indonesia is one of country which have a high risk level of disaster in the world [1][2]. World Risk Index 2017, stated that Indonesia is ranked 33rd in the world [1]. Indonesia is located in the three of world tectonic plates which are plates of Pacific, Eurasia, and Indo- Australia that pounding to each other and located in pacific ring of fire in the world with 127 active volcanoes [2]. This nature condition of Indonesia that causing the importance of disaster education in Indonesia. One of the important priority in disaster management especially in an attempt of disaster response and to have awareness towards disaster that occurs in Indonesia. Given that Indonesia is a disaster prone country, disaster mitigation learning is needed in an effort to minimize the large number of casualties[1].

An innovation in disaster education in Indonesia is implementing Kamishibai learning method which is one of learning innovation that using media of picture containing some information which delivered attractively and easy to understand [3]. Learning by using Kamishibai learning method can be delivered to the students of Elementary School (SD) and Junior High School (SMP) especially in the Social Studies. In the research of E. Futama, shows that learning which use media from the local culture would have bigger impact in obtaining awareness and response of disaster to decrease the disaster risks [3]. Learning by using Kamishibai method can give a metaphor or local tradition in the form of picture which can be adopted as the material of learning disaster mitigation [4]. Kamishibai method is more effective in elementary school and junior high school [5][6].
2. Methods

The method used in this study is a quasi-experimental design with one group pretest-posttest design[7]. In one pretest-posttest design group, only one class was used in the study. Research method that used in this research was a quasi-experiment. A. Jaedun explained that quasi-experiment is highly suggested in the education world of Indonesia [8]. This was caused by the condition of research objects which impossible to have random assignment. Another factor behind this statement is because there was formed a whole group naturally such as learning group in the class where the amount was also limited. This condition that makes researcher impossible to carry out the rules of true experiment. Since the controlling of variable related to the research subject cannot be done entirely so the research which related with enhancement of learning quality, Quasi-experiment research method is highly recommended [9]. Design of one group pretest-posttest that used in this research is one class that used in this research. Students in that class were given pretest before treatment and posttest after the treatment. Students in the class will be given a pretest before and posttest after treatment (Figure 1).

Figure 1. Quasi Design Experiment One Group Pretest-Posttest Design

In figure 1, O1 is the implementation of the Kamishibai method pretest, X is the treatment given, and O2 is the posttest implementation of the Kamishibai method. This research was conducted in the level of Junior High School (SMP) in the social studies with sub-material of Indonesian natural conditions. Class that used in this experimental research is class VII E with research subject of 40 people which consists of 25 female students and 15 male students. Those students were in one class that chosen by nonprobability sampling method. Type of nonprobability sampling that used was convenience sampling [9]. This sampling technique was chosen because the researcher can do the research only in the class that was provided by the school. Therefore, the sample may not necessarily represent the population and the information is available only to the chosen sample. Location selection in SMPN 1 Lembang was related with the location of the school that prone to the earthquake because of fault or Lembang fault. Instrument that used is the question in the form of pictures with five essay questions.

3. Results and Discussion

3.1. Results

Data to use Kamishibai learning method are from the score of students in their pretest and posttest and added with the conversion of value from the scale of 0 to 100. This value that has been converted then conducted the normality test and data homogeneity. The result of data normality is using Lilliefors with the help of Excel software. As well as the test of data homogeneity that also use Excel program. Data of normality and homogeneity test results are in this following table.
Table 1. Results of Data Normality Test of Pretest and Posttest of Kamishibai Learning Method

| Test      | Number of Students | Average | Liliefors Test Result | Significance | Conclusion |
|-----------|--------------------|---------|------------------------|--------------|------------|
| Pretest   | 40                 | 2.87    | 0.151                  | 0.014        | Abnormal   |
| Postest   | 40                 | 22.35   | 0.118                  | 0.200        | Normal     |

Source: Data processing result, 2019.

Based on the above table 1, it can be concluded that normality test significance of Kamishibai learning method of pretest shows the number of 0.014. So that, pretest data of Kamishibai learning method was abnormally distributed. Meanwhile, data normality test result of Kamishibai learning method in posttest shows the number of 0.200 > 0.05 so it can be concluded that posttest data of learning method are normally distributed. Besides data normality test, the test was also conducted with data homogeneity. The results of data homogeneity in Kamishibai learning method are as follows.

Table 2. Results of Data Homogenity Test of Pretest and Posttest of Kamishibai Learning Method

| Number of Students | Test Results |
|--------------------|--------------|
| 40                 | 58, 347      |

Source: Data processing result, 2019

Based on homogeneity test results of Kamishibai learning method shows the value of $\chi^2_{\text{arithmetic}} (58.347) > \chi^2_{\text{table}} (3.84)$. It can be concluded that pretest and posttest data that comes from inhomogeneous population. The difference of both data then tested with Wilcoxon’s Matched-Pairs Signed-Rank Test because pretest and posttest data of students does not meet the parametric statistical perquisite test and using non parametric statistics [10]. Results of different test of Kamishibai learning method of pretest and posttest are showed in Table 3.

Table 3. Results of Wilcoxon’s Matched-Pairs Signed-Rank Test for Pretest and Posttest Data in Kamishibai Learning Method

| Test           | Number of Students | Rank Average | Amount of Ranks | Significance |
|----------------|--------------------|--------------|-----------------|--------------|
| Pretest-Postest| 40                 | 19.25        | 598.00          | 0.00         |

Source: Data processing result, 2019.

Based on table 3, significance value with Wilcoxon’s Matched-Pairs Signed-Rank Test is 0.00. Because the value is less than 0.05, it can be concluded that Kamishibai learning method of pretest and posttest are different significantly. The next test result is by using the average of pretest and posttest scores using N-gain, to measure the effectivity of Kamishibai learning method.
Table 4. The Average of Pretest and Posttest Scores, Value of N-gain \(<g>\), and Effect Size of Kamishibai Learning Method

| Average   | Normalized Gain | Criteria | Effect Size |
|-----------|-----------------|----------|-------------|
| Pretest   | Posttest        | \(<g>\)  | Criteria   | D            | Criteria   |
| 2.87      | 22.35           | 0.20     | Poor        | 1.85         | Strong     |

Source: Data processing result, 2019.

Table 4 states that there was differences significantly, the amount of Kamishibai learning method enhancement was calculated with N-gain. Besides, the effectivity of Kamishibai learning method was calculated through the effect size. Results of N-gain and effect size calculation has a strong effect, which is 1.85.

After data testing statistically, the spreading of questionnaire was also conducted to the students in measuring their awareness and response of disaster. The instrument was consisted of several questions that related with knowledge of disaster, plan for disaster occurrence, disaster warning and resources mobilization. Results from the questionnaire is presented in this below graphic.

![Results of Questionnaire about Awareness and Response of Disaster](image.png)

Figure 1. Awareness and Response of Disaster

Source: Data processing result, 2019.

It can be concluded that the awareness and response of disaster of students in SMPN 1 Lembang are still relatively low which is 25% from 40 students, especially in the knowledge of disaster that consists of the definition of disaster, natural disaster occurrence, the cause of earthquake, and earthquake mitigation. Disaster mobilization was also have not been properly prepared in student evacuation when the disaster occurred.

3.2. Discussion

Kamishibai has been utilized since the Edo period. It was first modified from narrative pictures originating from the Netherlands. At that time, it was called Nozokikarakuri. It consisted of a picture 1.8 meters tall, in a box with a lens. By looking through the lens, one would be able to see the picture move and tell a story. Nozokikarakuri became very well known and popular among children[11]. Around two hundred years ago, the picture was transformed into transfer pictures developed by Vaudeville, by using a small wooden box, sheets of pictures, and light from a lamp. Children gathered while listening to the tales of the pictures’ sheets. These pictures were produced in large quantity in the Meiji period, with diverse techniques and
drawings. The pictures made their way to popularity in the field of education in this period, as a means of transferring knowledge to children [12]. Kamishibai method is also a very interactive method[13][14].

Test results of different Kamishibai using Wilcoxon Signed Ranks Test shows the result that different significantly. So that, Kamishibai learning method got different results, because by using Kamishibai learning method students are given the material of nature condition of Indonesia attractively through the message of picture [4][15]. That result also shows that Kamishibai learning method can train students to be aware and response to the disaster [16]. This was also supported by calculation results of effect size which obtain the effectivity level of 1.85. The result shows that Kamishibai learning method has a strong effectivity level to the awareness and response of disaster. The picture that used in Kamishibai with sub-material of Indonesia’s nature condition as follows:

![Figure 2. Map of Indonesia](image1)
![Figure 3. Tectonic Plate Process](image2)
![Figure 4. Indonesia’s Ring of Fire](image3)

The above pictures are some picture of Kamishibai learning method through picture technique and story-telling. Those picture explains the nature condition of Indonesia that covers geological location with the impact.

4. Conclusions

This research shows that Kamishibai learning method has a strong influence to the awareness and disaster response of students. It showed by Wilcoxon’s Matched-Pairs Signed Rank Test that was conducted. Effectivity of learning method are showed through effect size. Based on the results of effect size, that learning method has a strong effect to the awareness and disaster response of students. But, student’s knowledge of disaster was still relatively low.

Based on this research result, researcher who would conduct a research using Kamishibai learning method are recommend to add the time of treatment and picture that surely attractive, appropriate with local tradition. Because it needs a long time for student in understading disaster in Indonesia.

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