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VALIDITY AND PRACTICALITY OF STUDENTS WORKSHEETS IN DISASTER MITIGATION THROUGH ROLE-PLAYING METHOD TO TRAIN DISASTER MANAGEMENT

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Abstract

This study aims to describe the development of disaster mitigation students worksheets through the role playing method to train disaster management as well as the validity and practicality of the worksheets. This research was conducted based on the ADDIE development model with class VII K students in the 2019/2020 school year SMPN 21 Surabaya as research subjects. The research data was obtained through observation, interviews, and expert validation methods. The results of the validation assessment found that LKPD of disaster mitigation through role playing methods to train disaster management get very valid results where the content suitability aspect gets a mode 4 value, the presentation suitability aspect gets a mode 4 value, the language suitability aspect gets a mode 3 value, and the suitability aspect the learning method gets mode value 4. The results of the practicality assessment are based on the percentage of learning accomplishments and students activity where at the first meeting the value is 92.8% and the second meeting is 96.8% also the students activity reaches an overall average of all phasesis 92,3%. So that the disaster mitigation LKPD through role playing methods to train disaster management is considered very practical for applied during learning.

Keywords: validity, practicality, role playing

INTRODUCTION

Based on Law No. 20 of 2003 concerning the National Education System where education has a function in developing capabilities and shaping the dignified character and civilization of the nation in the context of educating the nation. Therefore, the quality of education is always improved every time carried out by the government which will later be adjusted to the objectives of national education. An example of the quality of education problems that needs to be fixed is regarding disaster mitigation education (Rizaldy, 2018). Increasing the capacity of students' knowledge about disaster, types of disasters, signs of impending disaster, the impact of disasters, and efforts to reduce disaster risk are efforts made in disaster mitigation education (Mardiyati, 2017). Referring to the attitude of the community in dealing with natural disasters, it can be concluded that the actions of the Indonesian population are generally less reactive and responsive to disaster events. This is inversely proportional to the condition of the State of Indonesia which is prone to disasters, where geographically, geologically, climatologically, and demographically Indonesia ranks seventh as the country © 2020 Universitas Negeri Surabaya

most vulnerable to the risk of natural disasters, especially earthquake and tsunami (Rizaldy, 2018).

Reflecting on the country's geographical conditions, curricular about disaster should be a learning process that is carried out in schools either integrated with other subjects such as Natural Sciences or Social Sciences or carried out independently through various activities (Wibowo, 2017). Because in the scope of science, what is learned by students is everything that touches the field of daily life, especially everything about natural phenomena including disasters. The natural phenomenon itself is closely related to the occurrence of disasters. The study of material on natural disasters in natural science subjects not only aims to improve students' understanding of concepts but is also expected to be able to build sensitivity or preparedness in students for disasters (Wibawa, 2013).

The 2013 curriculum has considered this disaster preparedness as an important thing to be taught. Seen in KD 3.10 grade VII where students are not only required to be able to explain material about the layers of the earth, volcanoes, earthquakes, but also must be able to communicate efforts to reduce risk both before a disaster, during a disaster, until after a disaster. But based on the



results of the pre-research conducted by researchers, as many as 84.84% of students claimed to have never learned or conducted simulations regarding earthquake disaster mitigation.

The lack of learning about disaster mitigation simulations was also justified by one of the science teachers from five science teachers at SMPN 21 Surabaya where learning about the earth layer was never accompanied by disaster mitigation. Forms of mitigation carried out at this school are only limited to fire disasters. Mitigation efforts are only limited to the actions that must be taken when the fire occurs without accompanied by prevention and recovery efforts after the fire disaster occurred.

According to data recorded by the National Disaster Management Agency (BNPB), from January to September 2019 as many as 2,102 disasters had been experienced by the State of Indonesia with 445 dead and missing. This figure still shows the need for education on disaster mitigation in Indonesia, especially in disaster prone areas. The city of Surabaya itself is bypassed by two active faults that have the potential to experience an earthquake. The two faults are the Surabaya fault which includes Surabaya, Keputih to Cerme, and the Waru fault which extends past Sidoarjo, Rungkut, Mojokerto, Jombang, Nganjuk (ITS News, 2018). In addition, the city of Surabaya is one of 29 cities or districts that are at high risk of experiencing a disaster (East Java BPBD, 2016). In fact, according to BMKG (2019), earthquake activity in Indonesia is very high, where on average every month there are 400 earthquakes. Therefore, it is very important to provide knowledge about disaster mitigation efforts, especially earthquakes and tsunamis for the people of Indonesia.

From the many cases of disasters that occur as well as their effects, disaster preparedness needs to be instilled as early as possible by providing knowledge about disaster management. Disaster management itself is a series of activities in disaster science ranging from aspects of prevention, planning, and the action to face a disaster that are interdependent to form a cycle. According to Public Safety Canada (2011) there are several phases that are mutually sustainable to deal with disasters, namely mitigation, preparedness, response and recovery. Disaster Management or also commonly referred to as emergency management is defined as knowledge, abilities, and actions both by the government, community groups, and individuals to effectively anticipate, respond to, and carry out recovery of events and impacts of disasters that have or will occur (UNISDR, 2011).

Disaster management involves things such as understanding the risks that can occur in the region, developing an emergency plan, and preparing tools to deal with disasters. The most important thing in disaster management is not only preparing an emergency plan, but also practicing this plan regularly as a form of preparedness (Levac et al, 2012). Knowledge about Disaster Management is very important because it aims to provide knowledge, skills, and motivation to individuals to take action to reduce a group's vulnerability to disasters. Besides education about disaster management if done early in stages it can increase the level of public awareness of a country. Individuals who are familiar with the concept of danger and disaster in their childhood can respond better and faster when disasters and accidents occur. (Torani et al. 2019).

The school is expected to provide students with recognition and habituation of potential natural disasters in their environment. Through this kind of learning, students are expected to understand the attitude that must be carried out in the pre-disaster occurrence, when the disaster occurred and how to overcome it, as well as shortly after the disaster (Utomo, 2018). Based on research conducted by LIPI in 2006 in Koswara and Trivono (2011) shows that the readiness of school residents to anticipate earthquakes and tsunamis is still low based on several parameters namely (1) Knowledge and attitudes towards disaster; (2) School policies in disaster learning; (3) Preparedness planning; and (4) Resource mobilization. According to Khoirunisa (2016) students are very important to be prepared in facing disasters. Regularly, disaster preparedness must be increased regularly by all school members and formed through simulations that can be carried out routinely either every semester or even every month.

On the topic of disaster, cooperative learning models become the most effective learning models to be applied through simulations and demonstrations (Wibawa, 2013 and Maryani, 2010). The role playing method becomes one of the methods used in learning simulation. In the field of disaster risk management, role playing games have increased public awareness to increase preparedness as well as in preventing loss from the impact of disasters (Terti et al, 2019). According to Hidayati and Pardjono (2018) said in their research results that this role playing learning model can make students easier to understand learning material compared to learning alone, fostering student attitudes and responsibilities, training students' independence and awareness of disaster.

Education about disasters that almost never happens in schools is also caused by one of them due to the unavailability of Student Worksheets (LKPD) that discuss the content of disaster management. This fact is also justified based on the results of an interview with one of the science teachers from five science teachers at SMPN 21 Surabaya. Whereas in the learning process, it is not only the selection of learning models that are important to prepare but also the teaching materials. Teaching materials are learning devices that contain material to be taught, media to be used, learning methods that are designed so that the objectives or competencies that have been determined can be achieved. Student Worksheet is one of the teaching materials that serves to direct students in learning through several activities that can be done independently by students (Lestari, 2013).

From the description above, the importance of about Disaster Management learning can be implemented, one of them is by developing disaster mitigation worksheet through the Role-Playing method



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that can direct student activities during learning while also training Disaster Management attitudes to students. But before it is applied in learning, the developed worksheet must meet several requirements namely validity, practicality, and effectiveness (Nieveen, 1999). Therefore, the purpose of writing this article is to describe the validity and practicality of disaster mitigation LKPD through the Role Playing method to train Disaster Management for students.

METHODS

Students worksheet development research in this study uses the ADDIE development model which consists of several stages namely analysis, design, development, implementation, and evaluation. However, in this study the worksheet developed only reached the implementation stage. In the research development of the Disaster Mitigation Students Worksheet, several stages such as Analyze, Design, and Development were carried out in the Natural Sciences Faculty of FMIPA UNESA from January to February 2020. Whereas the implementation stage was conducted in March 2020 at SMPN 21 Surabaya with class VII K as a subject research.

Qualified Student Worksheets must meet several requirements, one of which is to meet aspects of validity. The feasibility of a disaster mitigation worksheet through the role-playing method to train the developed disaster management is assessed based on theoretical validity. This theoretical validity is assessed based on four assessment criteria, namely in terms of content suitability, terms of presentation aspect, terms of language aspect, and in terms of suitability to the learning method to be used. The subject assessed in this study was the disaster mitigation students worksheet through the developed roleplaying method. The theoretical validity assessment was carried out by three validators.

The validation results that have been given by the validator through a validation sheet to assess the validity of the students worksheet that were developed are then analyzed using quantitative descriptive methods based on the table as follows:

Table 1. Validation Criteria

Assessment	Scale Value
Very Feasible	4
Feasible	3
Less Feasible	2
Not Feasible	1

(Riduwan, 2013)

Validation scores that appear most often are considered as modus values per rating criteria. This modus value is then interpreted according to the following table:

Table 2. Validity Interpretation based on Likert scale

Value	Criteria
3,26 - 4,00	Very Valid
2,51 - 3,25	Valid
1,76 - 2,50	Less Valid
1,00 - 1,75	Invalid

In addition to the validity aspect, the feasibility of the developed students worksheet was also assessed through practical aspects. This practical aspect is assessed based on the implementation of learning in the classroom using worksheets that were developed. The implementation of learning is observed by researchers, where researchers witness directly and provide an assessment of the ongoing teaching and learning process. Learning performance assessment scores refer to the Guttman scale as follows (Sapari, 2015)

Table 3. Criteria for interpretation of the Guttman scale

Answer	Score
Yes	1
No	0
	(Sapari, 2015)

The calculation results are then interpreted according to the table below

Table4.Rangeofpercentageoflearningaccomplishment

Percentage range (%)	Interpretation Criteria
0 – 19,99	Very Low
20-39,99	Low
40 - 59,99	Average
60 - 79,99	Good
80 - 100	Very Good

RESULT AND DISCUSSION

Analyze Stage

The first step in a research development is to analyze both the analysis of the curriculum and the problems that arise when learning in class. This also corresponds to the first stage in the ADDIE development model, namely analyze. At this stage the researchers analyzed core competencies and basic competencies based on the 2013 curriculum and conducted an interview with one of the science teachers at SMPN 21 Surabaya and distributed questionnaires filled out by students who would be the subject of research.

From the results of the analysis and interviews conducted, the results show that learning in KD 3.10 and 4.10 about the earth's layers and natural disasters has not been fully implemented. In KD 3.10 and 4.10 students are not only required to be able to explain material about the layers of the earth, volcanoes, earthquakes, but also must be able to communicate efforts to reduce risk both before a disaster, during a disaster, until after a disaster. But learning about communicating efforts to reduce disaster risk has never been done. Students are only asked to make posters about the layers of the earth. In addition, based on interviews with teachers stated that the absence of LKPD that facilitates learning about disaster mitigation also becomes an obstacle for teachers to implement KD 3.10 and 4.10 as a whole.

From the results of the pre-research questionnaire distribution it was also found that as many as 84.84% of students claimed that they had never learned about



disaster mitigation. Whereas in order to reduce the risk of many victims of disasters, one of the efforts that can be done is education about disaster mitigation must be implemented into education given the condition of children having a higher risk of becoming victims compared to adults when disasters occur (Pahleviannur, 2019).

Design Stage

The next step after analyzing is design. At this stage the researcher begins to design the students worksheet that will be created. From the design stage it was found that the students worksheet that will be developed is a worksheet on disaster mitigation using the Role-Playing method and aims to practice disaster management skills. Disaster management itself is a series of activities in disaster science ranging from aspects of prevention, planning, to disaster management that are interdependent to form a cycle. Disaster management capabilities that are trained only consist of mitigation, preparedness, and recovery phases without a response phase because at this stage it is the stage where the disaster actually happened (FEMA Training, 2015). The disaster management phases themselves can be seen in the following figure:

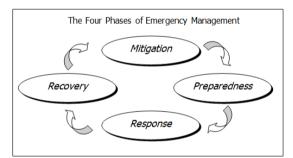


Figure 1. Cycle diagram of the phases of disaster management

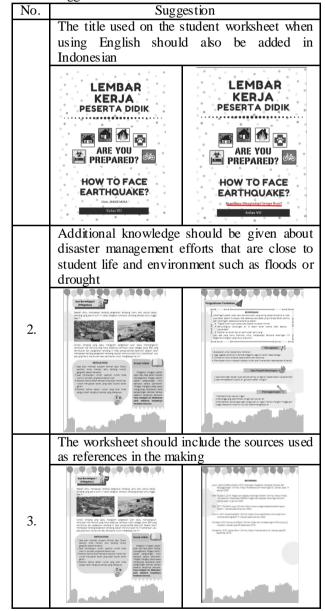
The material chosen is a subtopic of the lithosphere and earthquake disaster. The worksheet developed consisted of three worksheets, each for one meeting. Students worksheet 1 will train the disaster management phase of mitigation where in this phase students will learn about the efforts that can be made from far ahead to reduce the impact of a disaster that can occur at any time, Students worksheet 2 will train the disaster management preparedness phase where in the phase This student will learn about the preparation and plans that will be carried out when a disaster occurs such as the place to go to or the party to contact when a disaster occurs. In the students worksheet 2, the recovery phase is also trained where in this phase students will learn what actions need to be taken when the disaster is successfully passed (FEMA Training, 2015). While in students worksheet 3 students will learn about emergency plans and simulate them. Each worksheet developed consists of four parts, namely an introduction that contains the name of the group, learning objectives, analogies and learning material; role activity that contains tools and materials for doing role plays, game instructions, role player tasks, stage layout, scenarios, and staging questions; group discussions containing questions and conclusions; as well as the mitigating section containing disaster mitigation measures according to the phase in disaster management

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Development Stage

After determining the design of LKPD to be developed, the researcher then developed the design. The first draft of the developed LKPD will be reviewed by the lecturer, where the results of the study will be material for revising the developed LKPD. The results of the studies that have been carried out are given in the following table:

Table 5. Suggestion results of LKPD Draft 1



After LKPD draft 1 passes the review stage by the supervisor, the researcher then revises based on the advice given. The results of this revision will then become LKPD which will enter the validation stage and be implemented. The following is one example of LKPD



that has been developed and is ready to be implemented in learning

Implementation Stage

After the LKPD is developed, it will enter the validation stage before finally entering the implementation (Evaluation) stage. However, this research is only limited to the implementation stage without any evaluation stage. The following are the results of the validations that have been carried out and the practicality of the worksheets that have been developed as a form of implementation to the research subjects.

A. Validity Of Worksheets

One of the assessments in determining the feasibility of student worksheets is the aspect of validity. After the worksheets were developed, the worksheets were validated by three experts where two of them were lecturers at the Natural Sciences Faculty of FMIPA UNESA and one other person was a science teacher from the school who would be the subject of the study. The results of the validity assessment are presented in the following figure:

VALIDATION RESULT OF STUDENT WORKSHEET

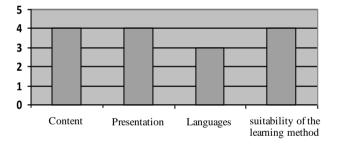


Figure 2. Validation Results

Based on the validation results, the content suitability aspect gets a mode value of 4 which based on the assessment criteria is considered very valid. This value was obtained because the content or learning material contained in the worksheet that was developed was in accordance with the Core Competencies or Basic Competencies that were analyzed based on the 2013 curriculum and also with indicators and learning objectives to be conveyed in which students learned about disaster management. This was also justified by Maiyuni (2016) who stated that student worksheets and teaching materials were said to be valid if they were arranged in accordance with predetermined indicators and learning objectives could be achieved. Because according to Vembriarto in Mustofa (2016) student worksheets must contain material that is able to be mastered by students and arranged systematically in order to achieve learning objectives.

The presentation aspect has a mode value of 4 which, based on the assessment criteria, is very valid. This means that the way the material is prepared and the illustrations illustrated in the student worksheets are well presented and can support the achievement of learning objectives. The location of the picture along with the description and procedures for writing on a worksheet that has been developed is good and makes it easy for students to understand the concepts to be learned. This is also supported by the opinion of Prastowo (2015) that a suitable LKS design can facilitate learning activities well so that learning objectives are achieved.

Languages aspect get a mode value of 3 from the validator which is based on the assessment criteria is valid. This value indicates that the language used in the worksheets developed is quite easy for students to understand. There are several words in the worksheet which according to the validator are quite difficult to understand by 7th grade junior high school students so they must be replaced with easier word synonyms. The choice of words or languages that are easily understood by students is very important in the formulation of worksheets because the language both verbally and in text is a communication medium that if it can be easily understood by students, the leaming achievement and delivery of the desired message can be realized (Wiratno, 2011).

While aspects the suitability with the method of learning the mode value obtained is 4 which based on the assessment criteria is very valid. This means that the worksheets that have been developed are in line with the learning plan that will be applied in class with the chosen method, the Role Playing method. In the worksheet developed there are features that correspond to the steps in the Role Playing learning method such as determining the stage set where the Role Playing method enters the stage setting, reading dialogs where the learning method enters the enacting stage, questions for observers who including the steps of preparing the observers on the Role Playing learning method, as well as group discussion questions everywhere in the Role Playing learning method including the Discussing and Evaluating step. Student worksheets must be in accordance with the model and learning method because they are based on the functions and benefits of the worksheets proposed by the Ministry of National Education (2007) that one of the functions of worksheets is as a learning guide so that their contents are activities that must be carried out by students.

Based on the validity assessment above the Disaster Management Students' Worksheet (LKPD) through the Role Playing method to train Disaster Management, it is considered feasible to be tested because it meets the specified components such as content suitability, presentation suitability, language suitability, and suitability with Role learning methods. Playing. This is in accordance with the opinion of Borsboom and Gideon (2014) that a product that is



suitable for use is a product that meets certain requirements or components.

B. Practicallity of Student Worksheets

1. Implementation of Learning

After going through the validation stage, the disaster mitigation LKPD is then applied or trialled to 36 students of class VII-K of SMPN 21 Surabaya. During the trial process one observer was tasked with observing the implementation of learning based on a learning plan that had previously been made by the researcher. The following are the results of observing the implementation of learning during the two meetings:

Implementation Percentage of Lesson Plan 1

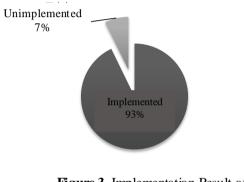


Figure 3. Implementation Result of Lesson Plan 1

Implementation Percentage of Lesson Plan 2

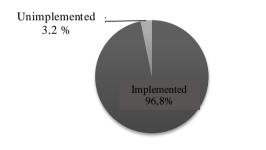


Figure 4. Implementation Result of Lesson Plan 2

In addition to validity, student worksheets must also be assessed for practicality when applying learning. From the picture above, it was found that the value of learning in first meeting was 92.8% with an unimplementation of 7.2%. While at meeting 2 the implementation was 96.8% and the unimplementation was 3.2%. The percentage of this learning ineffectiveness arises because there is a learning step not implemented. At first meeting there were two steps of learning that were not carried out, the first was giving associations regarding the movement of plates with other knowledge and the second was giving further assignments in the concluding part when learning would end. While at the second meeting only one step of learning was not achieved, namely in the provision of further work in the concluding section. Of the two meetings that have been conducted, only the closing part of the learning was not carried out. However, these steps are not included in the role playing method phase, meaning that at each meeting all phases of learning based on the role playing method have been carried out in full. The closing part of each lesson is not implemented due to time constraints. The limited learning time and the phases of the role playing method are quite dense causing the learning step in the closing section at the end of learning is often missed. This is also in accordance with the statement of Djamarah (2010) that one of the shortcomings of the role playing method requires a lot of time both from the preparation stage to the implementation.

Based on the range of the percentage of the implementation of learning, the implementation of learning both at first and second meeting, including very good. Therefore it can be said that the worksheets developed are considered practical. Because LKPD is said to meet the practical aspects if the implementation of learning meets the percentage $\geq 60.0\%$ (Damayanti et al. 2017). This shows that with the worksheets developed, the learning process using cooperative learning models with the Role Playing method can be implemented well and in accordance with the phases contained in the learning method such as warm up the group where in this phase the teacher starts to raise problems and foster student awareness that the problem must be studied, selecting participants is the stage where the teacher asks students to choose the cast who will play, Setting the stage is the stage to prepare took and materials and arrange the stage according to the scenario to be played, preparing the observers where at the stage This teacher tells the task to students who do not participate in role play regarding their assignments, enacting is the stage of role playing done, and discussing and evaluating is the stage after the role play has been completed and conducting discussions based on what has been observed during the game role in progress

Role Playing Learning itself is one of the methods in the cooperative learning model whose application can make students learn actively through role playing (Hales and Cashman, 2008). Cooperative learning especially Role playing or simulation methods is considered the most appropriate method in learning disaster mitigation and training in disaster management (Disaster Management) (Maryani, 2005). Because through the roleplaying approach (Role-Playing approach) can facilitate cooperation and interdisciplinary argumentation about emergency response in a fun way. This will increase the level of confidence in decision making under pressure (Terti et al, 2019).

Therefore, based on the description above when tested in the class, students worksheets of the disaster mitigation with the developed Role Playing method is considered very practical, which means that this LKPD can be a fun companion or learning resource in the classroom because through this role playing, students will be required to do



role plays where this it can also make the material being discussed become entertainment (Santoso, 2011) and make students play an active role in learning because students not only listen or discuss information passively, but are also actively involved to gain knowledge of a topic and use that knowledge to portray it. Finally on learning there will be an emphasis on active participation that can improve the quality of learning itself (Saptono, 2010).

2. Student Activity

Besides based on the implementation of learning, the practicality of an students worksheets can also be assessed from student activities when using the LKPD. Following is the percentage of student activity during learning based on the phases of the role playing method used

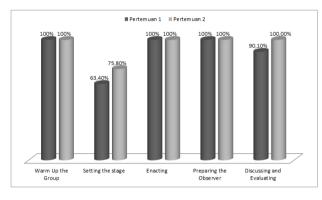


Figure 5. Percentage of Student Activity

From the picture above it can be seen that all students can carry out almost every phase of the role playing method. The warm up the group phase is the initial phase where the teacher will provide stimulus in the form of reading or video about the topic or problem to be played. Based on the picture above, both at meeting 1 and 2 get a percentage of 100%. This means that all students carry out this phase well. In the research conducted, the video is used as a stimulus for students in the warm up the group phase. The selection of various learning media such as video as a stimulus can attract students' interest in learning and make learning more fun and not monotonous. Besides that through suitable and diverse learning media can clarify the subject matter to be delivered (Saputra, 2015).

Based on Figure 5 above, student activity during the stage setting stage does not reach 100%. This means that in this phase there are some students who do not carry out activities as instructed, where in the first meeting only amounted to 63.4% while in the second meeting amounted to 75.8%. The stage setting phase is the phase where students and the teacher prepare the stage. However, in this study the stage used is the same type of stage for one time role play which is used for one class. Therefore, due to limited space that is not too broad and limited time, not all students or only a few students who help teachers to prepare the stage to be used. Because one of the weaknesses of the role playing method according to Djamarah (2010) is the need for ample land to play role playing. Because not all students carry out activities

in this phase, students who do not participate in preparing the stage end up doing activities that are not relevant to learning such as talking to themselves with friends. Therefore, good classroom management is needed when applying this learning method

In the enacting phase the percentage of students both at meeting 1 and 2 reached 100%. This means that all students in charge of playing the role can carry out this activity well. In this study not all students get roles but only group representatives with a total of 15 students. While other group members totaling 18 students were assigned to be observers and carry out the preparing the observer phase. Therefore, in the phase of preparing the observer the percentage also reaches 100%. Because although not all students perform the same task because the division of tasks between the role players (enacting) and (preparing the observer) becomes the observer, but all students carry out the phases of the role playing method based on the learning plan that has been made. Teachers can train students to accept and share responsibility with friends or groups through the distribution of tasks of this kind on the role playing method (Djamarah, 2010).

The last phase is discussing and evaluating where based on Figure 5 above has increased from the first meeting which only reached a percentage of 90.1% to 100% at the next meeting. This increase was caused because at the first meeting there were some students who left the classroom in the middle of learning because they were taking part in organizational activities. While at the second meeting all students were able to follow this phase well even though some of them had time to carry out activities that were not relevant to learning such as talking to themselves and making a crowded atmosphere. In this phase each group comes forward to read the "staging questions" about the role play that has just been done while the other groups must provide a response. This continues until each group gets their tum.

Based on the results of the implementation of learning and student activities when the learning takes place using LKPD whose percentage exceeds 61% in all phases, the LKPD of disaster mitigation through role playing methods to train disaster management is very practical to apply to learning.

CONCLUSION

Based on the results of the research conducted, it can be concluded that the Disaster Mitigation Student Worksheet with the role playing method to train the developed disaster management can be declared suitable for use based on the aspect of validity that gets mode 4 values or is very valid on the aspects of content suitability, suitability of presentation, and suitability with learning methods and get a value of 3 or valid on aspects of language suitability. Meanwhile, based on practical aspects, LKPD developed into the category of very practical for use in learning after two meetings got a percentage of 92.8% and 96.8% respectively and student activity reached a total average of all phases of 92.93%.



SUGGESTION

Based on experiments that have been done by researchers, suggestions that can be given are:

- 1. In developing LKPD with a similar topic namely disaster management, it needs to be adjusted to the threat of disasters that are around the area where the LKPD will be implemented.
- 2. In implementing the LKPD that is developed, it requires discipline in time management and good classroom management so that the learning steps can be carried out appropriately.
- 3. When learning takes place at the enacting stage (role playing) it is better to do a repetition several times so that students really understand what is to be conveyed from the role play.

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