Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

Development of SISTANA-based LKPD to enhance understanding of volcanic disaster mitigation at elementary schools

Submitted:
29 mey 2023
Accepted:
20 juny 2023
Published:
31 july 2023

Hajir Misbahuddin[1], Frans Aditia Wiguna[2]
hajirmisbah@gmail.com[1], frans@unpkediri.ac.id[2]
Primary School Teacher Education, Teaching and Science Faculty, Nusantara University PGRI Kediri [1,2]

Abstract: The limitation of students' understanding of disaster mitigation led the researchers to conduct a study that combined two previous studies, resulting in a new finding called Sistana. This research aimed to describe the suitability, effectiveness, and student response to the learning media in the form of Sistana-Based Student Worksheets (LKPD) in enhancing their understanding of disaster mitigation during the 6th-grade Social Studies class in Elementary School. The development model utilized by the researchers was the 4D model, which consists of four main stages: define, design, develop, and disseminate. The validation results by material experts showed a percentage of 80% as "valid." The media experts obtained a percentage of 84% as "valid," while the evaluation experts scored 80% as "valid." Furthermore, the results of the trial showed that the students' average pretest score was 43.1, and their posttest score was 88.1, indicating an improvement of 45 points. Finally, the student's assessment of the use of LKPD Sistana resulted in a 92% "very good" response rate. Therefore, it can be concluded that the developed LKPD Sistana is relevant and engaging as a learning medium to enhance students' understanding of disaster mitigation.

Keywords: LKPD, Sistana, Understanding Disaster Mitigation.

PRELIMINARY

Geographically, Indonesia is an archipelagic country located at the convergence of four tectonic plates: the Asian Continental Plate, the Australian Continental Plate, the Indian Ocean Plate, and the Pacific Ocean Plate (Atmojo, 2020). This convergence of four tectonic plates is the reason why Indonesia has many volcanoes, making it prone to various disasters, particularly volcanic eruptions (Maryati, 2016). Being situated in the Pacific Ring of Fire, Indonesia holds the record for having the largest number of active volcanoes in the world, with a total of 130 active volcanoes (Atmojo, 2020; Rahma, 2018).

One of these volcanoes is Mount Kelud. Geographically, Mount Kelud is positioned at 7°56'00" S and 112°18'30" E, and administratively it spans three regencies: Kediri Regency, Blitar Regency, and Malang Regency (Damayanti Wardyaningrum, 2014; Huda, 2019). Historical records show that Mount Kelud has experienced 131 eruptions, estimated from 1000 AD to 1990 AD, claiming more than 15,000 lives. Additionally, since the year

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

2000 AD until the present, it has erupted twice, in 2007 and 2014 (Paripurno, 2015; Saputra et al., 2020).

The understanding of disaster mitigation among elementary school students on the slopes of Mount Kelud, particularly in the Social Studies subject, is one of the solutions to ensure that these students are aware of potential threats that can endanger lives and negatively impact society (Pahleviannur, 2019). Additionally, this initiative aims to reduce the level of mortality and accidents among elementary school children. Children often become victims of injuries during natural disasters. According to the latest data from the United Nations International Strategy for Disaster, 60 percent of children worldwide are victims of natural disasters (Anisah & Sumarni, 2019; Purwanto & Kistiyanto, 2017). This is a serious issue because the impact of disasters will affect the physical and psychological well-being of children in the next 10-20 years (Thoyibah et al., 2019).

This research focused on students who reside on the slopes of Mount Kelud and have a limited understanding of disaster mitigation, aiming to achieve successful implementation of disaster-resilient educational units. Disaster-Resilient Educational Units (SPAB) are organized educational structures that prioritize safety in both normal conditions and during disasters (Wedyawati et al., 2017).

This research focuses on students who reside on the slopes of Mount Kelud and have a limited understanding of disaster mitigation, aiming to achieve successful implementation of disaster-resilient educational units. Disaster-Resilient Educational Units (SPAB) are organized educational structures that prioritize safety in both normal conditions and during disasters (Wedyawati et al., 2017).

From previous research, many disaster mitigation programs have primarily focused on adults to understand and recognize disaster mitigation, both at the national and regional levels. Examples of such programs are SPAB and PRB, but those that are more directed at elementary school students have not been maximally implemented.

The objective of this research is to promote understanding of disaster mitigation among a broader and more diverse segment of society, not only targeting adults and the elderly but also ensuring that children are aware of and comprehend disaster mitigation as a preparation for becoming resilient individuals in facing future disasters.

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

METHODS

This study is a type of research and development (R&D). The research and development focus on the development of instructional media in the form of LKPD (Student Worksheets). This development research employs the research and development method, which aims to produce a product and test its effectiveness (Anesia, R., B.S. Anggoro, 2018; Rahayu & Budiyono, 2018), using Thiagarajan's (1974) well-known 4D (four-D) development model (Rahayu & Budiyono, 2018). The reason for using this model is due to its systematic stages, which are suitable for development research. The product resulting from this development is in the form of LKPD Sistana book, which serves as a student learning medium. The stages of the research and development model are as follows: (1) defining, (2) designing, (3) developing, and (4) disseminating.

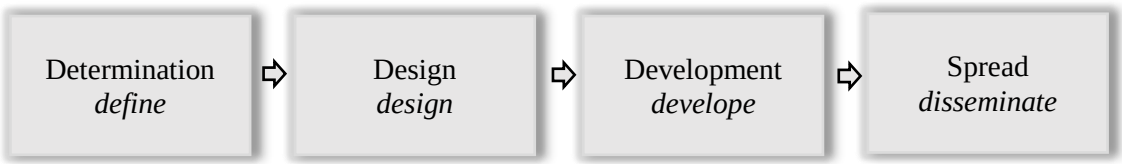

Figure 1. 4D development stages

The research was conducted from November to December 2022 at SDN Satak 1, located in Satak Village, Puncu District, Kediri Regency. The research object was a limited trial and field trial involving the 6th-grade students of the school. The limited trial was conducted with all 6th-grade students participating. Each student was given a worksheet with several questions related to disasters. The field trial was also carried out with all 6th-grade students involved. The field trial spanned two days and followed a pre-agreed schedule. Throughout this period, both teachers and students used the instructional media in the form of LKPD Sistana.

The first stage is the defining stage. The defining stage is the initial phase to determine the structure and content of the instructional media that will be developed, aligning it with the Basic Competencies (KD), learning objectives, and scope of the 6th-grade Social Studies material. This stage is carried out through five steps, namely: Frontend Analysis, Learner Analysis, Task Analysis, Concept Analysis, and Learning Objective Analysis (Rahayu & Budiyono, 2018).

The second stage is the designing stage. The steps taken in this stage include: (1)

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

development of assessment standards, (2) selection of media appropriate to the characteristics of the material and learning objectives, (3) development of SISTANA-based LKPD learning media, which involves evaluating existing learning media and determining the media to be developed, and (4) creating an initial design appropriate with the selected media.

The third stage is development, which aims to produce the development product and is carried out through two steps: (1) expert appraisal followed by revisions, and (2) developmental testing. The types of data obtained from the development of SISTANA-based LKPD media are qualitative and quantitative. The qualitative data is obtained from critiques and suggestions from the learning media testing team, which consists of media experts, material experts, and teachers. The validity of the learning media will be assessed by media experts and material experts. The practicality of using the learning media will be evaluated by subject teachers. Additionally, quantitative data will be collected through pretest and posttest questions answered by students.

The fourth stage is Dissemination, which aims to disseminate the developed product to a wider audience to test the effectiveness of its use. However, in this research and development, the researcher only reached the development stage due to time constraints for broader dissemination.

This development research is One Group Pretest Posttest Design. Try out by using the pretest first then the results are known after the posttest. This study began by distributing pretest questions to students, then explaining the social studies subject matter in the natural phenomena chapter, if students felt they understood, then the researcher applied the Sistana LKPD in learning. Finally, the students were given the same set of questions again as a posttest, and the results will be compared to assess the suitability of the developed LKPD Sistana.

The subjects in this study included: material and question expert Mr. Erwin Putra P, S.Pd., M.Pd, media expert Mr. Jatmiko, M.Pd, evaluation expert Mr. Dr. Dhian Nur Wenda, S.Pd., M.Pd, and 22 students from SDN Satak 1 Puncu.

Table 1

Assessment Criteria According to the Likers Scale	
Criteria	**Score / Score**
Very Good (SB)	5
Good (B)	4

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

Less Good (KB)	3
Not Good (TB)	2
Very Bad (STB)	1

Source :(Damayanti & Dewi, 2021)

Based on the criteria in Table 1, if the obtained score is equal to or greater than 4, the product can be subjected to field testing.

Table 2

Assessment Criteria According to the Likers Scale	
Criteria	**Percentage (%)**
Very Unfeasible	0-20
Unfeasible	21-40
Feasible	41-60
Feasible Enough	61-80
Highly Feasible	81-100

Source :(Damayanti & Dewi, 2021)

Based on the criteria in Table 2, if the results of student responses obtain results of more than 60%, the product can be used by students. Furthermore, to get the results of the percentage of students' classical completeness obtained using the formula below:

$$Formula = \frac{Total\ of\ students}{Complete\ numbers\ of\ Students}\ X\ 100$$

After the results of the value are known, the calculation to get the value of learning outcomes can also be obtained with the N-gain Score formula as follows:

$$< g >= \frac{Score\ after - Score\ before}{maximum\ score - score\ before}$$

The learning outcomes can be considered to have improved if the value of n-gain is greater than 0.3, and the classification is as follows:

Table 3

N-Gain Standard Value Classification	
Default N-Gain Value	**Classification**
G > 0.7	High
0.7 > g < 0.3	Medium
G < 0.3	Low

DISCUSSION

1. DISASTER MITIGATION

Disaster mitigation according to (Meviana & Susanti, 2019; Suarmika & Utama, 2017) is a series of actions or strategies carried out before, during, and after a disaster occurs to reduce the adverse effects and losses incurred. The goal of disaster mitigation is

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

to minimize risk and prevent or reduce damage to human life, property, the environment, and the economy due to natural or human-caused disasters. Some important steps in disaster mitigation include: Risk Assessment, Extension and Education, Disaster-Resilient Development, Resource Management, Natural Resources, Early Warning Systems, Mapping and Monitoring, Training and Exercises, Emergency Planning, Collaboration, Coordination, and Policy Formulation. By implementing appropriate disaster mitigation strategies and actions, it is expected that communities and regions can become better prepared to face disasters and reduce the negative impacts caused by them.

2. LKPD

Learner Worksheets (LKPD) is a document or sheet that is given to students as a guide or learning material in a teaching and learning activity (Rahayu & Budiyono, 2018). LKPD contains tasks or activities that must be carried out by students as part of the learning process.

The purpose of LKPD is to help students understand the concept of learning by actively participating in activities assigned by the teacher (Rahayu & Budiyono, 2018). LKPD can also be used as a tool to measure student learning progress, monitor their progress, and facilitate interaction between teachers and students. LKPD includes various types of activities, such as questions to answer, exercises, group discussions, experiments, or small projects. The contents of the LKPD can be adjusted to the level and subject being studied by students. In addition, LKPD can also function as reference material for students in repeating material that has been studied in class.

LKPD is prepared by the teacher or educator, following the curriculum and learning guidelines that have been set. Each worksheet is usually related to a particular topic or learning unit.

3. SISTANA LKPD

LKPD Sistana is a book that contains pictures related to disasters and the subject matter of volcanoes (Rahayu & Budiyono, 2018). This LKPD has several advantages, such as : 1) Interesting, this Sistana LKPD is composed of text, pictures, and colors so it makes it unique, 2) Realistic, in showing material discussions are presented with real objects through colorful pictures, 3) It can overcome time constraints and space, 4) Easy to understand, Sistana's LKPD is easy to understand, because it used clear language and is appropriate with the needs of elementary school children, 5) Can be used for the general

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

public, 6) Designed according to the wishes and needs. In developing this learning media, it is necessary to organize a good design so that the resulting product can be declared feasible and according to needs.

RESULTS

Results of Development Research of Sistana LKPD

1. Defining Stage

At this stage, a problem was obtained, namely elementary school students' lack of understanding about disaster mitigation. Based on student analysis, the researcher decided to develop a Sistana LKPD as a learning medium for grade 6 Social Studies material which aims to support the optimization of understanding of disaster mitigation so that when an eruption occurs as soon as possible to take relevant action and save themselves from the threat.

2. Design Stage

In the designing stage, it produces an initial draft of the Sistana LKPD which will be developed. In this planning stage there are 3 steps, namely: (1) preparation of test standards (criterion-test construction) containing material and questions related to natural phenomena and disaster mitigation, (2) selection of media according to the characteristics of material and learning objectives, (3) Development of SISTANA-based LKPD, reviewing existing learning media and determining learning media to be developed in the form of understanding, and implementing disaster mitigation, and (4) making initial designs according to the selected media, adjusting the material to the geographical conditions of the school.

3. Development Stage

The development stage produces a product in the form of a Sistana LKPD book as a learning medium which has gone through a revision process starting from the review in the form of suggestions or input to validation from the validators. The parties who act as validators are: material and question experts Mr. Erwin Putra P, S .Pd., M.Pd, media expert Mr. Jatmiko, M.Pd, evaluation expert Mr. Dr. Dhian Nur Wenda, S.Pd., M.Pd. At the development stage, implementation was also carried out by teachers and students of grade 6 SDN Satak 1 Puncu to test the effectiveness and practicality of the Sistana LKPD.

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

a. Feasibility of Sistana LKPD

The validation results from material experts on Sistana LKPD in Social Studies class 6 about natural phenomena get the following results:

Table 4

MATERIAL VALIDATION RESULTS		
Variables	**Percentage**	**Eligibility Criteria**
Accuracy	80%	Feasible
Completeness	80%	Feasible
Attention	80%	Feasible
Impact on Students	80%	Feasible
Impact on Teachers	80%	Feasible
understanding	80%	Feasible
Total Percentage	**480%**	**-**
Average Percentage	**80%**	**Feasible**

Source : (Damayanti & Dewi, 2021)

Based on Table 4 it is known that the accuracy variable gets a validation percentage of 80% (feasible). At 80% completeness variable (feasible). Attention variable 80% (feasible). The impact variable for students is 80% (feasible)). Furthermore, the impact variable for teachers is 80% (feasible). Lastly, the understanding variable is also 80% (feasible). So the validation of the Sistana LKPD development material in Class 6 Social Studies about natural phenomena gets a percentage of an average score of 80% (feasible). Furthermore, the validation results from media experts get the following results:

Table 5

MEDIA VALIDATION RESULTS		
Variables	**Percentage**	**Eligibility Criteria**
Accuracy	80%	Feasible
Appearance	90%	Highly Feasible
Letter	88%	Highly Feasible
Ease of Use	80%	Feasible
Total Percentage	**338%**	**-**
Average Percentage	**84.5%**	**Highly Feasible**

Source :(Damayanti & Dewi, 2021)

Based on the table above it is known that the media validation results on the readability variable are 80% (feasible). At 90% display variable (highly feasible). Next, the letter variable is 88% (highly feasible). Finally, the ease of use variable is 80% (feasible). Practical media is media that considers aspects of the use mechanism (Mustaqim, 2017). So the development of Sistana LKPD in Social Studies Class 6 about natural phenomena in media validation gets an average of 84.5% (highly feasible). Finally,

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

the validation results from the evaluation experts obtained the following results:

Table 6

EVALUATION VALIDATION RESULTS		
Variables	**Percentage**	**Eligibility Criteria**
Accuracy	80%	Feasible
Completeness	80%	Feasible
Question Writing	80%	Feasible
Question Quality	80%	Feasible
Language	80%	
Total Percentage	**400%**	**-**
Average Percentage	**80%**	**Feasible**

Source :(Damayanti & Dewi, 2021)

Based on the table above, it can be seen if all variables in the evaluation validation which include the variables of accuracy, completeness, question writing, question quality, and language get the same percentage of results, namely 80% (Feasible). So the average percentage obtained from evaluation validation is 80% (feasible).

b. The effectiveness of the Sistana LKPD

In the limited trial, the test was conducted at SDN Satak 1 Puncu with a total of 22 students. Ten pretest questions were given to the students before using LKPD Sistana, and after using it, ten posttest questions with the same criteria were given. The results of the student's scores from the pretest and posttest are as follows:

Table 7

PRETEST POSTTEST RESULTS			
Name	***Pretest***	***Posttest***	**Information**
Student 1	30	90	complete
Student 2	60	100	complete
Student 3	40	80	complete
Student 4	30	80	complete
Student 5	40	80	complete
Student 6	50	80	complete
Student 7	30	60	Not Completed
Student 8	40	100	complete
Student 9	50	100	complete
Student 10	60	100	complete
Student 11	50	80	complete
Student 12	40	100	complete
Student 13	40	100	complete
Student 14	60	100	complete
Student 15	70	90	complete
Student 16	40	90	complete
Student 17	20	70	Tiudak Complete
Student 18	50	90	complete
Student 19	30	100	complete
Student 20	10	70	Not Completed
Student 21	60	90	complete

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

Student 22	50	90	complete
Total	**950**	**1940**	-
Average	**43,1**	**88.1**	-

Source :(Damayanti & Dewi, 2021)

Based on the table above, after conducting the pretest, it is found that the average score of the pretest for the students is 43.1. Subsequently, after implementing the developed LKPD Sistana, the posttest was administered to assess the extent of learning improvement achieved by the students. The average score of the post-test obtained by the students is 88.1. Thus, with an increase of 45 points from the pretest to the posttest, it can be concluded that the use of LKPD Sistana has improved the students' understanding of disaster mitigation.

However, it is important to note that the average score of the pretest still did not meet the classical mastery criteria, whereas the average score of the posttest did meet the criteria. This is evident from the percentage of students who answered correctly, which is ≥61% after the intervention. The percentage of students who achieved mastery is 86%, where 19 students are considered to have mastered the material, while 3 students have not yet achieved mastery.

c. Student response to Sistana LKPD

Student response sheets were distributed by distributing worksheets and the following results were obtained:

Table 8

STUDENT RESPONSE RESULTS		
Variables	**Percentage**	**Eligibility Criteria**
Didactic Terms	90%	Highly Feasible
Construction Terms	90%	Highly Feasible
Technical Requirements	96%	Highly Feasible
Total Percentage	**276%**	-
Average Percentage	**94%**	**Highly Feasible**

Source :(Damayanti & Dewi, 2021)

From the table above, it can be seen that the results of student responses carried out on 22 students through worksheets obtained an average in the "Highly Feasible" category with 92% (highly feasible) consisting of 90% didactic requirements (highly feasible), 90% construction requirements (highly feasible) and technical requirements of 96% (highly feasible).

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

CONCLUSION

Based on the conducted research, the results indicate that the use of LKPD Sistana is valid, effective, and practical for enhancing the students' understanding of disaster mitigation in elementary school education. The study also demonstrates that educational reforms and improvements in the learning process can lead to increased student learning outcomes. Furthermore, the implementation of LKPD enables students to be aware of disaster mitigation from an early age so that in carrying out their daily routines they can be vigilant and ready to accept the threat of natural disasters that may strike at any time.

REFERENCES

Anesia, R., B.S. Anggoro, dan I. G. (2018). Pengembangan media komik berbasis android pada pokok bahasan gerak lurus. *Indonesian Journal of Science and Mathematics Education*, *01*(1), 53–57.

Anisah, N., & Sumarni, S. (2019). Model Sekolah Aman Bencana Dalam Upaya Mewujudkan Pendidikan Karakter di MIN 1 Bantul. *LITERASI (Jurnal Ilmu Pendidikan)*, *10*(1). https://doi.org/10.21927/literasi.2019.10(1).9-20

Atmojo, M. E. (2020). PENDIDIKAN DINI MITIGASI BENCANA. *Jurnal Abdimas BSI: Jurnal Pengabdian Kepada Masyarakat*, *3*(2), 118–126. https://doi.org/10.31294/jabdimas.v3i2.6475

Damayanti, N. A., & Dewi, R. M. (2021). Pengembangan Aplikasi Kahoot Sebagai Media Evaluasi Hasil Belajar Siswa. *EDUKATIF: Jurnal Ilmu Pendidikan*, *3*(4), 1647–1659.

Damayanti Wardyaningrum. (2014). Perubahan Komunikasi Masyarakat Dalam Inovasi Mitigasi Bencana Di Wilayah Rawan Bencana Gunung Merapi. *Jurnal ASPIKOM*, *2 Nomor 3*, 179–197.

Huda, A. M. (2019). Model Strategi Pengembangan Sosial Radio Komunitas dalam Mitigasi Bencana Di Kawasan Gunung Kelud. *Aristo*, *7*(2), 277. https://doi.org/10.24269/ars.v7i2.1749

Maryati, S. (2016). Sinergi Perguruan Tinggi-Pemerintah-Masyarakat dalam Pengurangan Risiko Bencana Alam. *Prosiding Seminar Nasional Geografi UMS 2016: Upaya Pengurangan Risiko Bencana Terkait Perubahan Iklim*, 202–207.

Meviana, I., & Susanti, N. E. (2019). Pelatihan Manajemen Mitigasi Bencana Erupsi Gunung Api Kelud Di SDN Penataran 1 Kecamatan Nglegok Kabupaten Blitar. *Dedication : Jurnal Pengabdian Masyarakat*, *3*(2). https://doi.org/10.31537/dedication.v3i2.233

Pahleviannur, M. R. (2019). *SEBAGAI UPAYA PENINGKATAN PENGETAHUAN SISWA*. *29*(1), 49–55.

Paripurno, E. T. (2015). *Efektifitas Sistem Peringatan Dini Berbasis*. *1*.

Purwanto, P., & Kistiyanto, M. S. (2017). DINAMIKA SPATIO-TEMPORAL DAMPAK ERUPSI GUNUNG KELUD DI KABUPATEN KEDIRI. *Jurnal Pendidikan*

Jurnal Pendidikan Dasar Nusantara Vol 9, No 1, Juli 2023
ISSN 2579-6461 (Online) ISSN 2460-6324 (Print)
DOI: https://doi.org/10.29407/jpdn.v9i1.20530

Geografi, *22*(1). https://doi.org/10.17977/um017v22i12017p060

Rahayu, D., & Budiyono. (2018). Pengembangan Lembar Kerja Peserta Didik Berbasis Pemecahan Masalah Bangun Datar. *Jpgsd*, *6*(3), 249–259. https://media.neliti.com/media/publications/254876-pengaruh-metode-permainan-sirkuit-pintar-8f6b2278.pdf

Rahma, A. (2018). Implementasi Program Pengurangan Risiko Bencana(PRB) Melalui Pendidikan Formal. *Jurnal VARIDIKA*, *30*(1), 1–11. https://doi.org/10.23917/varidika.v30i1.6537

Saputra, D. P., Alfaritdzi, R. M., & Kriswibowo, A. (2020). MODEL MANAJEMEN BENCANA GUNUNG MELETUS DI GUNUNG KELUD. *Public Administration Journal of Research*, *2*(2). https://doi.org/10.33005/paj.v2i2.41

Suarmika, P. E., & Utama, E. G. (2017). Pendidikan Mitigasi Bencana Di Sekolah Dasar. *JPDI (Jurnal Pendidikan Dasar Indonesia)*, *2*(2), 18–24.

Thoyibah, Z., Dwidiyanti, M., & Mulianingsih, M. (2019). *5328-16080-1-Sm*. *2*(1), 31–38.

Ulfa, E. H., Rijal, A. S., Matalapu, I., Jaya, R., Maulana, K. M., Purwandari, E. P., Winarni, E. W., Andreswari, D., Andrian, D., & Apriyanti, W. (2021). Animasi Edukasi Kesiapsiagaan Gempa Bumi Sebagai Sumber Literasi Bencana. *LaGeografia*, *19*(1), 123–132. www.wartabencana.com.

Wedyawati, N., Lisa, Y., & Selimayati, S. (2017). Pengaruh Model Pembelajaran IPA Terintegrasi Mitigasi Bencana terhadap Hasil Belajar. *Jurnal Edukasi*, *15*(2), 261–273.