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The Disaster Box Mystery as a Media for Growing Disaster Preparedness and Literacy among Junior High School Students

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Abstract

The focus of this research is to strengthen landslide disaster mitigation literacy in students using Mystery Box media. The ADDIE paradigm was employed in this study's quantitative and qualitative methods. A material expert who was a teacher at SMPN 1 Sambeng, a linguist who was a professor at the UNISLA Science Education Study Program, a media expert who was 35 students at SMPN 1 Sambeng, and a disaster extension practitioner were the subjects in this study. Focusing on the paired sample t test findings, the significance of 0.000<0.005 demonstrated a significant difference between the pretest and post-test literacy of students, implying that the mystery box media was able to raise students' literacy for landslide catastrophes. The advice for future study is that engagement with students be enhanced so that excellent communication happens, allowing the knowledge offered to be delivered to the greatest extent possible and assisting students in increasing their motivation in the realm of literacy.

Keywords: Literature; Disaster Mitigation; Mystery Box

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INTRODUCTION

Disasters are natural and unnatural occurrences that are impossible to predict when they occur and what occurs in society, thus we must remain vigilant in all conditions and situations at all times (Afrian & Islami, 2019; Kritsyaningrum et al., 2021). Natural disasters are occurrences induced by natural phenomena that can disrupt community and environmental activities, kill people, and harm the environment (Ashraf, 2021). Natural disasters will have far-reaching consequences in every element of life, including the economy, society, health, and science.

In terms of disaster science, it is difficult to forecast the magnitude or negative impact of a disaster after it has occurred. Disasters, according to Prihantini et al., (2020) are natural processes that occur more frequently than usual and cause ordinary difficulties for humans due to significant damage, so that disasters pose a threat to humans or the environment, including Indonesia, which is a disaster-prone area. The lesser the people's knowledge of natural disasters, the less education there is for the public about the hazards of natural disasters, as evidenced by the enormous number of victims in every catastrophe that happens. Data on the number of catastrophes that occur on Indonesian territory has grown year after year, one of which is landslides (Adri et al., 2020). For example, consider the Sukabumi landslide, which killed 22 people and destroyed a large amount of property (Karim et al., 2019). The reason of the landslide in the region was determined to be torrential rain that washed surrounding the village of Sinarresmi, creating surface runoff in the forest and rice

fields. Water saturation in the forest and rice field regions caused hills to slip, and debris flowed down the slopes and piled up around 34 traditional village dwellings below. The primary cause of landslides is the community's lack of disaster literacy. As a result, studying natural disaster mitigation is required to educate the public about the hazards of natural catastrophes (Septaria et al., 2020).

Learning is fundamentally an effort held by an educator to teach his pupils, therefore being able to lead via student contact with other learning materials, in order to reach the educator's intended aims (Song & Zhou, 2020). Learning is a two-way relationship between an instructor and students, both of which can achieve a defined objective through excellent and controlled communication. Learning media are learning materials that students may use. Educational media, which may transmit facts and ideas more effectively through a mix of three-dimensional components, is one type of learning media that can be employed (Wibowo & Pradana, 2022).

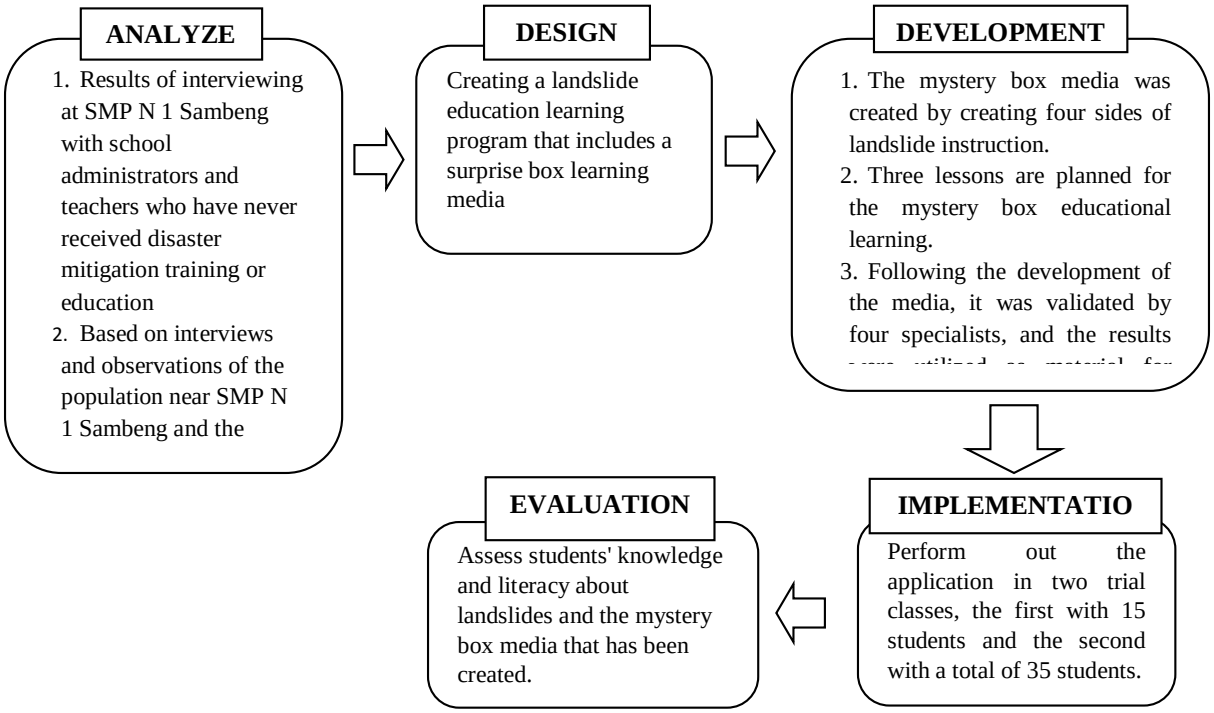
Husnah et al., (2021) discovered that learning media had an influence on students' knowledge via various trainings. Another research, Siti Wasliyah (2018), supports the notion that the type of learning material used has an influence on disaster preparation. Based on the findings of the relevant study, it is possible to conclude that learning media is an essential component of the teaching and learning process between educators and students. The Mystery Box is an appropriate learning material to use in landslide disaster mitigation learning (Prastyo et al., 2021). Mystery Box is a traditional learning tool that helps instructors learn. The mystery box is also a variety in teaching and learning activities that keeps the learning process from becoming too boring (Asrizal & Festiyed, 2020). Another application for the Mystery Box is as a gaming medium, not only for the instructor to explain but also to engage the students. For example, in one class, 30 students are separated into groups, and each group plays the game. The usage of mystery box media is done alternately, with students coming forward to read and explain the selected landslide mitigation content after opening each side in turn. Landslide mitigation is very much needed in the community in potential places, therefore early education in the community is required, which may be taught via learning in schools.

Increasing community literacy is critical, and it may be accomplished through education beginning in elementary school, so that catastrophe hazard knowledge can be embedded in early life (Archila et al., 2021). Following an interview with the principal at the State Junior High School (SMP) 1 Sambeng on October 9, 2021, there is still a lack of understanding or education of kids about catastrophe threats and how to overcome them, owing to a lack of educational resources that may assist participation. In the learning process of recognizing the hazards of disasters, a lack of socialization about disasters is one of the causes of the community's low insight, along with a lack of instruments or media to educate the public. Aside from SMP Negeri 1 Sambeng, the surrounding environment, including the local community, is still vulnerable to natural calamities, one of which being landslides.

According to the findings of three science junior high school teachers interviewed in October 2021, natural disaster material is seldom taught and there is no new knowledge of disaster mitigation in the development of media literacy. The findings of RPP observations for each subject at SMP Negeri 1 Sambeng demonstrate that there is only one hour of instruction on natural catastrophes, while the conditions around the school are extremely prone to landslides, particularly in scientific disciplines. As a result, landslide catastrophe education media is urgently needed to be established in Indonesian schools, as 90% of the courses in the school have never developed media. The peculiarity of this study is that it focuses on the misty box educational media, which is frequently heard as a misty box to surprise people, yet this mystery box can improve students' passion in studying landslide catastrophes.

METHOD

This is a form of research and development (R&D). In a broad sense, research and development (R&D) is the methodical application of creative effort and expertise based on new applications to increase scientific and technological understanding (Sukaisih et al., 2020). This study was carried out in the Junior High School (SMP) Negeri 1 Sambeng in Kedungwangi, Sambeng District, Lamongan Regency, East Java Province. While the research was conducted between October 2021 and January 2022. The research was carried out with the intention of developing sources of Learning Natural Sciences for students in Junior High School who are interested in catastrophe mitigation. This study's subjects comprise 1) material specialists, 2) linguists, 3) media experts, and 4) disaster extension practitioners. The subject matter expert is a teacher at SMP Negeri 1 Sambeng. The linguist is a lecturer at Lamongan Islamic University's Science Education Study Program. The media specialists are the topic of a restricted trial with 15 students, and the ultimate trial with 35 students will take place in September 2021 - April 2022. This study approach employs the ADDIE stage, which allows for the evaluation of development activities at each level (Teguh & Wawan, 2019). The ADDIE paradigm comprises five stages: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation (evaluation).



The approach of interviews, questionnaires/questionnaires, and tests was employed in this study. Interviews were done to acquire preliminary data and learn about school-related issues. The questionnaire approach (questionnaire) was utilized to obtain the mystery box media validation data from four experts (material experts, linguists, media experts, and disaster extension practitioners). The test approach uses mystery box media to assess comprehension of landslide disaster literacy before and after deployment.

This research instrument employs the following components: (1) Interview sheets, which are used to collect preliminary empirical data on school conditions related to disaster mitigation education, potential disasters in community schools, and the importance and necessity of this research; (2) Validation questionnaire, which is used to collect validation data from four expert tests (material experts, linguists, media experts, and disaster extension practitioners); and (3) To answer students, researchers devised 15 literacy skills; the outcomes of filling out students are intended to be the result of literacy held by students without influence from others.

Table 1 shows the experts on the learning media development grid instrument used in this study.

Table 1. Material Expert Grid Instrument

No	Aspect	Indicator	Number of Items
1	Ingredients	a. The use of examples in the mystery box media makes it easier to understand the material b. The material on the misty box media is easy to understand c. The presentation of the material on the mystery box media is in accordance with what is learned at school	3
2	Material Clarity	a. Use of the examples presented is relevant. b. Clarity of material in basic competencies. c. Clarity of material in policy indicators. d. Clarity of the material in the learning objectives. e. The clarity of the material is easy to reach.	5
3	Content Representation	a. The accuracy of the examples in understanding the material. b. Content accuracy. c. The truth of the concept of matter. d. The material presented is relevant. e. Clarity of presentation of material	5

(adapted from Kritsyaningrum et al., 2021)

Table 2 shows the learning grid instrument specialists in learning media development research use.

Table 2. Instruments Grid on Linguists

No	Aspect	Indicator	Number of Items
1	Message Clarity	a. Presentation of material motivates students to learn b. The presentation of the material attracts students' interest in learning c. Explanation of information is very easy and helpful.	3
2	Interesting Attention	a. The media mystery box features a compelling media offering b. Misty Box media presents a fun presentation of material for students.	3

(adapted from Kritsyaningrum et al., 2021)

Table 3 lists the learning media development grid instrument specialists.

Table 3. Grid of Media Expert Instruments

No	Aspect	Indicator	Number of Items
1	Media Visualization	a. Systematic clarity and material flow. b. Clarity of images and material in the media c. The size of the media according to the material. d. The attraction of mystery box media for students e. The accuracy of the location of the image object f. Accuracy in the use of language. g. Clarity of the material presented in the media h. Media hints in easy media	7
2	Media	a. Title clarity b. Media content clarity c. The accuracy of the size and layout of the mystery box media d. Clarity of appearance and sound of misty box media e. Materials and animations can motivate learning	5

(adapted from Kritsyaningrum et al., 2021)

Table 4 shows the tool used by skilled disaster extension practitioners.

Table 4. Instruments of the Expert Grid of Disaster Extension Practitioners

No	Aspect	Indicator	Number of Items
1	knowledge and Attitude	Knowledge: - Natural events and disasters (type, source, magnitude, location) - Physical vulnerability (location, condition of critical facilities, building standards) Attitude towards disaster risk	3
2	System warning disaster	a. Traditional Local b. Technology (sign, signal, standard c. Warning dissemination and mechanisms d. Practice and simulation	4
3	Emergency Plan	a. Family plans for responding to emergencies b. delivery plan c. First aid, safety, safety and security d. Fulfillment of basic needs e. Equipment and supplies f. Important amenities	6

(adapted from Kritsyaningrum et al., 2021)

The validator receives the validation sheet by putting in a sign in the column with the response choices, which are fully agree (SS), agree (S), disagree (KS), disagree (TS), and completely disagree (STS). Data Analysis Techniques, the acquired data will be evaluated. The researcher will examine the study data utilizing (1) Analysis of the Validity of Learning Media, which will be compared to the research validity criteria; (2) Data from the student literacy test were analyzed using SPSS Version 26 software to examine the validity of the student literacy test instrument, homogeneity and normality, and the influence of using mystery box educational media on student literacy.

RESULTS AND DISCUSSION

The stages of the ADDIE model were used in this study, which was carried out at SMP Negeri 1 Sambeng Lamongan from December 2021 to April 2022. Each stage of development using the ADDIE model has been completed and produces outputs, namely (1) the analysis stage, which produces initial data, namely that 90% of teachers have never developed learning tools and learning media in disaster mitigation materials, which means that students have never experienced a disaster that occurred in surrounding areas, so when a disaster occurs, the potential for damage and loss of life increases. These findings serve as the foundation for the significance of this research, which is believed to be valuable for every citizen school and the community in the school environment.

The design phase (2) of the ADDIE development model resulted in the design of the necessary solutions to the challenges at SMP Negeri 1 Sambeng in the form of learning devices and learning material using the Mystery Box design. The ADDIE approach resulted in the development of landslide mitigation learning tools for three meetings at the development stage (3), and the mystery box media with four sides of the box was employed. Following validation on four experts, the following data was obtained:

Table 5. shows the results of expert validation of device and media mystery boxes.

Expert	Validation Result Percentage (%)	Criteria
Materials	88	Very Valid
Media	96	Very Valid
language	90	Very Valid
Practitioner (Disaster Counselor)	94	Very Valid
Average	92	Very Valid

According to the expert's validation of the mystery box device and media, the landslide disaster mitigation learning device and the mystery box were pronounced genuine and could be utilized in the scientific learning process at school (Septaria et al., 2022). Evidence of this validity is critical in gauging the real and learning tools and media generated in measuring the goals of a program, as well as as a requirement for the continuation of later-stage research (Damayanti et al., 2020; Try Ulfah Anggriani, 2014; Wibowo & Pradana, 2022). The implementation stage (4) was carried out twice, the first time with a sample of 15 students and the second time with a sample of 35 students.

Table 6. Suggestions and improvements to media misty box

No	Suggestion	Repair
1	Because the box is built of robust material rather than stereophonic media, consumers are students with high kinesthetic activity.	The original stereoform hazy box material was replaced with plywood and wood on the poles.
2	Color is required in the misty box media to boost the attraction of the media to students.	The box's exterior has been painted, and each decorative medium has been colored on the inside.
3	The mystery box media is too little for students to thoroughly experiment with and witness its application.	The initial side dimension of the media misty box was 25 cm, which was increased to 40 cm.
4	Additional requirements for utilizing misty box material are required.	A media usage guide for Misty Box has been produced.
5	Student worksheets must include experimental variables pertaining to adjustable plane slopes.	In the student experiment, the slope variable has been included.

The researchers' ideas have been totally improved, and various new components have been incorporated to increase the quality of the mystery box media. To optimize utilization and attainment of the specified goals, media enhancement is required (Anisah & Sumarni, 2019; Suyono & Muskhir, 2021). Each learning media must consider several factors in its use, including safety, attractiveness, student mobility space, and usefulness in learning (Aqmal Nurcahyo et al., 2020; Firaina et al., 2019). Following the completion of the mystery box media learning, the literacy test was administered utilizing the created instrument. The findings of the literacy test used to assess the instrument's validity, as well as the results of the validation assessment on 15 literacy items, are provided in the table below:

Table 7. Results of item validation about student literacy

No. Instrument	r-Calculate	r-Table	Sig.	Decision
1	0.5563	0.5140	0.05	Legitimate
2	0.6564	0.5140	0.05	Legitimate
3	0.5342	0.5140	0.05	Legitimate
4	0.5345	0.5140	0.05	Legitimate
5	0.5223	0.5140	0.05	Legitimate
6	0.5622	0.5140	0.05	Legitimate
7	0.6464	0.5140	0.05	Legitimate
8	0.7345	0.5140	0.05	Legitimate
9	0.6346	0.5140	0.05	Legitimate
10	0.6232	0.5140	0.05	Legitimate
11	0.5253	0.5140	0.05	Legitimate
12	0.6734	0.5140	0.05	Legitimate
13	0.7455	0.5140	0.05	Legitimate
14	0.6437	0.5140	0.05	Legitimate
15	0.5275	0.5140	0.05	Legitimate

According to the conclusion in table 7, which is based on r count > r table, 100 percent of the instruments disclosed are legitimate. The validity of this test instrument is thought to be precise and on target in measuring student literacy (Abdurrahman, 2021; Sudrajat, 2020). The variables to be assessed must be precisely measured using research tools (Prakoso et al., 2021; Prihantini et al., 2020). Furthermore, the reliability test revealed a Cronbach's alpha value of 0.676>0.6, indicating that the instrument (n = 15) was trustworthy.

Following experiment 1 and changes to numerous misty box media, the test was repeated with more samples, specifically 35 students. Following experiment 2, students' literacy pre-test and post-test scores were generated. The pre- and post-test results of the students were utilized as material for determining class normalcy and homogeneity as follows:

Table 8. Shows the results of normality tests on research trial samples.

		Kolomogrov Smirnov			Shapiro Wilk		
Literacy	Class	statistics	df	Sig	Statistics	df	sign
	Pre test (trial 1)	.137	15	.161	.935	15	.204
	Post-test (trial 1)	.165	15	.073	.913	15	.063
	Pre-test (trial 2)	.185	35	.204	.863	35	.123
	Post-test (trial 2)	.167	35	.235	.963	35	.231

Results The normality test (Table 8) revealed that the significance value in the test class attempt 1 and test class try 2 in a row was more than 0.05, indicating that the data is normally distributed. Following the normalcy test, the researcher performed a homogeneity test based on the literacy outcomes data from the test subject attempt (Fadilah et al., 2020; Studi et al., 2020). The following table shows the results of the homogeneity test:

Table 9. Results of Homogeneity Test of Research Trial Samples

		Levene Statistic	df1	df2	sig
Literacy Results	Based on Mean	1.227	1	161	.263
	Based on Median	857	1	064	.348
	Based on Mean and with adjustad df	857	1	45.310	.350
	Based on trimmed mean	1.176	1	58	.274

Based on the findings of the homogeneity of the test subjects trial (based on Mean) having a significance value of 0.263>0.05, it was determined that the examined data was homogenous and that the parametric empirical test may be continued. Furthermore, the paired sample T test parametric test was used to assess the influence of the mystery box learning media at the time of the researcher and before to learning on students' disaster literacy. The Paired sample t test results are shown in table 10 below:

Table 10. Paired sample test results

Item	**Mean**	**Std. Dev**	**t**	**df**	**p**
Pre Test-Post test	-17.23140	7.42457	-12.570	34	.000

According to the table. Paired sample t test, significance value (2-tailed) 0.000<0.005 demonstrates a significant difference between students' pretest and post-test literacy, suggesting that the mystery box media can raise students' literacy for landslide catastrophes.

CONCLUSION

According to the findings of this study, the mystery box media is capable of increasing the literacy of landslide catastrophe pupils at SMP Negeri 1 Sambeng Lamongan. This rise in disaster literacy is intended to be the start of student and community awareness in

recognizing and safeguarding the surrounding environment from possible catastrophes, as well as educating everyone in the community and mitigating the harmful effects of disasters.

RECOMMENDATION

Further research recommends being more diversified in creating learning media to educate disaster mitigation, in order to promote the creativity of students and teachers in schools and make learning less repetitive. In certain cases, researchers may be able to free students to create disaster mitigation media in order to explore students' ideas and develop students' kinesthetic abilities.

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