

## EMITVEL (Earthquake Mitigation Visual Novel): Media For Learning Earthquake Mitigation in Elementary Schools

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### ABSTRACT

*The study aimed to determine the process of developing EMITVEL application media as a medium for earthquake disaster mitigation in elementary schools and the effectiveness of EMITVEL media as a learning medium for earthquake disaster mitigation. This study uses questionnaires and documentation data collection techniques to adapt the research and development (R/D) phase 1 approach with EMITVEL media development variables. This study concludes by analyzing quantitative descriptions; the EMITVEL application, from the assessment of media experts, is reasonably practical as a learning medium for earthquake disaster mitigation, with details of software engineering aspects at 65%, learning design aspects at 61%, and visual communication aspects 64%. Meanwhile, the practitioner's assessment has effective criteria as a learning medium for earthquake disaster mitigation, with details of 69% software engineering, 66% learning design, and 69% visual communication. This means that the EMITVEL media is suitable as a learning medium for earthquake disaster mitigation in elementary schools.*

### Keywords:

Learning; Earthquake; Media; Disaster Mitigation; EMITVEL

### ABSTRAK

*Tujuan penelitian adalah mengetahui proses pengembangan media aplikasi EMITVEL sebagai media mitigasi bencana gempa bumi sekolah dasar dan mengetahui tingkat keefektifan media EMITVEL sebagai media pembelajaran mitigasi bencana gempa bumi. Penelitian ini menggunakan adaptasi dari*

*pendekatan research and development (R/D) tahap 1 dengan variabel pengembangan media EMITVEL menggunakan teknik pengumpulan data kuesioner dan dokumentasi. Penelitian ini menyimpulkan dengan analisis deskripsi kuantitatif, aplikasi EMITVEL dari penilaian ahli media cukup efektif sebagai media pembelajaran mitigasi bencana gempa bumi dengan rincian aspek rekayasa perangkat lunak 65 %, aspek desain pembelajaran 61 %, dan aspek komunikasi visual 64 %. Sedangkan, pada penilaian praktisi mempunyai kriteria efektif sebagai media pembelajaran mitigasi bencana gempa bumi dengan rincian aspek rekayasa perangkat lunak 69 %, aspek desain pembelajaran 66 %, dan aspek komunikasi visual 69 %. Artinya media EMITVEL layak sebagai media pembelajaran mitigasi bencana gempa bumi sekolah dasar.*

**Kata kunci:**

Pembelajaran; Gempa Bumi; Media; Mitigasi Bencana; Emitvel

## 1. Introduction

Disasters are events or series of events that threaten and disrupt people's lives and livelihoods that occur due to natural and non-natural factors as well as human factors, resulting in human casualties, environmental damage, loss of property, and psychological impacts (Kartika, 2023). According to data from the National Disaster Management Agency (2017), the number of disaster incidents in Indonesia grew by around 20 times between 2002 and 2016. Within 11 years of observation, the cumulative incidence of earthquakes in Indonesia was 71,628 (2009-2019) (Sabtaji, 2020). Geological disasters are the most devastating type of human mortality; more than 90% of human casualties are killed or missing due to tsunami and earthquake disasters. It is anticipated that 66 million children worldwide will be affected by disasters next year. Disaster risk reduction requires the right strategy so that losses from all aspects can be reduced. One of the strategies in reducing disaster risk is mitigation which is implemented in the world of education (Deansikutari, 2022).

Natural disasters have a low level of public awareness. The high number of fatalities supports the statement. Natural disasters pose a high threat to children, according to PP No. 21 of 2018. The large number of children who are victims of disasters is a result of their lack of understanding of disaster preparedness when natural disasters strike (Termini et al., 2020). Understanding current and future natural disasters is critical because communities must defend themselves from the threat of coming natural disasters and provide reliable communication between generations.

This establishes the foundation for disaster education starting at a young age, which has evolved into a proactive approach for individuals aware of natural disasters (Setyowati, 2019). Because Indonesia is a disaster-prone country from a geological and climatological perspective, and because local knowledge may be acquired to prevent or at least decrease the impact of natural disasters on society, an early warning system is critical in dealing with natural disasters. (Juhadi et al, 2018). Knowledge of many types of disaster information that can pose a threat to society, such as signs of

disaster, recommended shelters, and other information, can be highly beneficial to the community in dealing with oncoming disasters and can assist in reducing the number of disaster victims (Astuti & Setyaningsih, 2016). Disaster mitigation lessons in formal education, such as schools, are one means of distributing knowledge. This agrees with (Pahleviannur, 2019); the school is one of the educational institutions with a strategy and responsibility for developing students' knowledge and abilities in natural disaster preparedness and mitigation (Pahleviannur 2019).

The earthquake in Cianjur is an example of an earthquake that claimed many lives. One is the victim, whose average age is under 16 years. Approximately 44%, namely 21%, are toddlers aged 0-5 years, and 23% are children aged 6-16 years. This happened because when the earthquake occurred, it coincided with school hours starting (Kompas). In Blora Regency, even though earthquakes rarely occur, preparedness is still needed. By doing disaster mitigation learning. Because learning is not limited, and one way to increase preparedness is to do learning in formal schools. This follows UU Number 2007 chapter 26, which explains that everyone has the right to receive education, training, and skills in managing natural disasters.

The need for learning earthquake disaster mitigation at an early age, especially in formal elementary school education, so that groups vulnerable to earthquake disasters have preparedness to deal with earthquake disasters. However, the condition of the Covid-19 pandemic has disrupted earthquake disaster mitigation learning in schools because learning is carried out in a limited way by conducting online learning. Conditions like this require technology to deliver earthquake disaster mitigation learning even though learning is carried out remotely. Therefore, in this study, the researchers developed the EMITVEL (Earthquake Mitigation Visual Novel) application as a remote learning solution for earthquake disaster mitigation. So, offline and online learning are considered necessary, but interactive distance learning will increase students' learning motivation in understanding material with modern technology (Chalysta & Damayanti, 2020). Because, Digital media education has two objectives, namely the first is that empowerment is used to help students understand how to use smartphones and digital information effectively and efficiently. The role of the media in the learning process is very important, because in learning activities of ambiguity in the material conveyed can be assisted by using the media as intermediary (Budiarti, 2022).

Meanwhile, the second purpose of security is to protect students from the adverse effects of technology and digital media (Prasetyo & Kuswardani, 2021). This type of game consists of animation, images, sound, interactivity, and dialogue combined with adventure games which mostly display static images, generally depicted in an anime cartoon style (characters in animated films) (Aliv Faizal, 2017). The visual novel also contains a narrative with long conversational text and displays static graphics, sound, and video (Admaja et al., 2015).

Visual novel games consist of three elements including visual characters, visual narration, and visual style (Pratama et al., 2018). This is also in line with the opinion (Amalo et al., 2017) visual novel games consist of (1) background and character graphics, (2) audio consisting of character voice actors, background music, and audio effects, (3) dialogue (4) grading system, and (5) interactivity.

## 2. Methods

### 2.1 Research Approach

The implementation of this research uses a simple experimental approach by adapting Research and Development (R/D) phase 1. R&D research is a method used to produce specific products and test the effectiveness of the products being developed. To produce or develop a product, of course, use research with the nature of needs analysis. This research focuses on the development of EMITVEL media with six stages, namely:

(1) Potential and Problem

The researcher was looking for empirical data in the form of secondary data regarding the potential for earthquakes in Blora Regency and COVID-19 data.

(2) Information Collection

Collecting materials related to earthquake disaster mitigation, lesson plans, and learning strategies, collecting videos, determining evaluation tools, and collecting visual images that clarify the material.

(3) Product Design

Arranging the materials sought to be used as a unit in making the EMITVEL design by Coding. In coding the EMITVEL design, the researcher used the Ren'Py software (Agusalim, 2015).

(4) Product Design Validation

Media experts and practitioners assessed the EMITVEL application to determine the effectiveness of the media by guiding aspects of software engineering, learning design aspects, and visual communication.

**Table 1.** Validators

Name	Status	Institution
Pradika Adi Wijaya, S.Pd, M.Pd	Lecturer	Semarang State University
Ria Nurul Faiza, S.Pd. SD	Classroom Teacher IV	
Dwi Puji Ratnawati, S.Pd. SD	Classroom Teacher V	Public elementary school 1
Wahyu Purnama, S.Pd. SD	Classroom Teacher VI	Tamanrejo, Tunjungan sub-
Dina Andirahayu, S.Pd. SD	Classroom Teacher VI	district, Blora Regency
Sri Hartati, S.Pd. SD	Classroom Teacher IV	
Rahayu Dwi Nurcahyani, S.Pd. SD	Classroom Teacher V	Public elementary school 1
Hari Sulistiyani, S.Pd. SD	Classroom Teacher VI	Tutup, Tunjungan sub-district, Blora Regency
Kusumastuti Ratnaning Triworo, S.Pd. SD	Classroom Teacher IV	
Guntur Cahyo Prasetyo, S.Pd. SD	Classroom Teacher V	Public elementary school 2
Budi Astuti, S.Pd. SD	Classroom Teacher VI	Tutup, Tunjungan sub-district, Blora Regency

Source: Research 2021

(5) Design Revision

Weaknesses of the EMITVEL application were corrected with the guidance of input from media experts and practitioners.

(6) Product trials

Testing EMITVEL media on a small scale in class IV at Public elementary school 1 Tamanrejo, Tunjungan sub-district, Blora Regency, to find weaknesses in EMITVEL media in the learning process of earthquake disaster mitigation.

*2.2 Data Collection*

Using a mixed-method research design to expand and strengthen the study (Schoonenboom & Johnson, 2017), this study applies:

(1) Questionnaire

(2) This technique was distributed to 11 respondents with details of respondents four teachers at SD N 1 Tamanrejo, three teachers at SD N 1 Tutup, three teachers at SD N 2 Tutup, and 1 Lecturer in Geography Study Program, Semarang State University for the EMITVEL media assessment. Meanwhile, the test is used to find the effectiveness of EMITVEL media.

(3) Observation

(4) Observation techniques are used to collect data on an overview of schools. They are used for observations in the learning process of earthquake disaster mitigation using EMITVEL media in small-scale trials.

(5) Test

(6) The test collection technique retrieves student learning outcomes in earthquake disaster mitigation learning using EMITVEL media.

(7) Documentation

(8) Documentation techniques are used to collect data regarding identifying potential problems, gathering information, and designing documentation when conducting research.

*2.3 Data Analysis Technique*

The analysis technique used in calculating media validity is descriptive quantitative with a Likert scale measurement by describing the variables into several indicators as benchmarks in assessing the developed media.

This study uses the Rating Scale formula whereby looking for the number of criteria scores with the formula:

$$\text{Highest Score for Each Item} \times \text{Total of Question Items} \times \text{Total of Respondents}$$

Then look for the percentage that is used to determine the category of the product being assessed. Formula :

$$\frac{\text{Data collection score}}{\text{total of criteria scores}} \times 100\%$$

From the percentage that has been searched, then determine the effectiveness category as follows

**Table 2.** Media Effectiveness Category

Percentage (%)	Criteria
80 – 100	Very Valid
66 – 79	Valid
56 – 65	Enough
40 – 55	Invalid
30 – 39	Very Invalid

Source: (Sugiyono, 2008)

The variables from this study can be seen in Table 3, along with the indicators and data collection.

**Table 3.** Research Variable

Variable	Indicator	Data Collection
EMITVEL Media Media Development Process	Potential and Problem	Observation, Documentation
	Data Collection	Observation, Documentation
	Desain produk	Documentation
	Validasi design	Questionnaire
	Perbaikan design	Documentation
	Product trials	Observation, Test

Source: Research 2021

### 3. Results and Discussion

This research was conducted in Blora Regency with 3 locations, including Public elementary school 1 Tamanrejo, in Tunjungan District, Public elementary school 1 Tutup in Tunjungan District, and Public elementary school 1 Tutup in Tunjungan District. The implementation of this research lasted approximately three months, from December 6, 2021, until February 19, 2022.

An overview of elementary schools for the EMITVEL media development research site. Tables can be seen in Table 4, Table 5, and Table 6.

**Table 4.** Total Number of Student

School	Student
Public elementary school 1 Tamanrejo,	139
Public elementary school 1 Tutup	138
Public elementary school 2 Tutup	130

Source: Research 2021

**Table 5.** Total Number Of Teachers

School	Teacher
Public elementary school 1 Tamanrejo,	11
Public elementary school 1 Tutup	9
Public elementary school 2 Tutup	9

Source: Research 2021

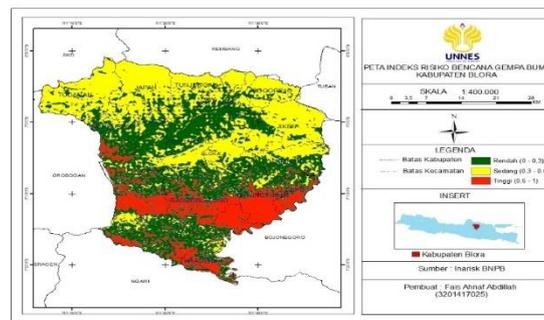
**Table 6.** School Facility

School	Facility	Total
Public elementary school 1 Tamanrejo,	Classroom	7
	Library	1
	Teacher's room	1
	Toilet	2
Public elementary school 1 Tutup	Classroom	6
	Library	1
	Teacher's room	1
Public elementary school 2 Tutup	Toilet	3
	Classroom	6
	Library	1
	Teacher's room	1
	Toilet	2

Source: Research 2021

### 3.1 Result From the Development Process of EMITVEL (Earthquake Mitigation Visual Novel)

#### 3.1.1 Identification of potential and problem



**Figure 1.** Blora Regency Earthquake Risk Index Map

At the stage of identifying potentials and problems, the researcher identifies by looking for secondary data. Blora Regency is included among 26 regencies in Central Java that have a high earthquake-prone potential, according to the Indonesian disaster risk index document (BNPB, 2021). The Disaster Safe Education Unit pioneered by the Ministry of Education and Culture and BNPB issued a disaster-resilient education book. Blora Regency from various school agencies, especially elementary and junior high schools, are at low to moderate earthquake risk in every sub-district in

Blora Regency (SPBA, 2017). According to the Blora Regency Covid-19 monitoring data, during the period on December 16, 2021, there were still Covid-19 cases. Despite all these, the pandemic in Blora has significantly decreased. However, learning is still limited in education, particularly in elementary school. As a result, it is vital to use media that can assist in the delivery of subject matter for learning to become efficient and successful. Early childhood earthquake disaster mitigation learning has been affected by the Covid-19 pandemic, particularly in elementary schools. In order to prepare for earthquake disaster preparedness in the Blora district, it is critical to learn about earthquake disaster mitigation.

**Table 7.** Earthquake in Blora Regency

Years	Location	Impact
2019	Japan	no impact
2021	Blora	no impact
2022	Blora	no impact

Source: Detik News 2021

Based on those problems, the researchers developed distance learning media for earthquake disaster mitigation so that students have provisions for earthquake disaster preparedness even with the Covid-19 pandemic or already in normal conditions.

### 3.1.2 Data Collection

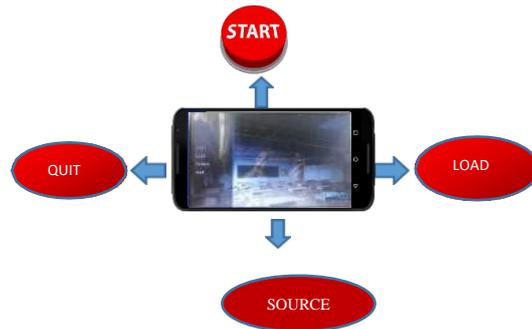
In developing the EMITVEL (earthquake mitigation visual novel) media, the content of the media is adjusted to the learning themes and sub-themes appropriate to earthquake disaster mitigation. Because in elementary school learning, the teacher is required to develop the material. The following is data collected for media development, including:

- (1) Formulating lesson plans.
- (2) Establishing strategies for delivering and managing learning content, selecting learning models, and determining evaluation tools.
- (3) Collecting materials, videos, and pictures.

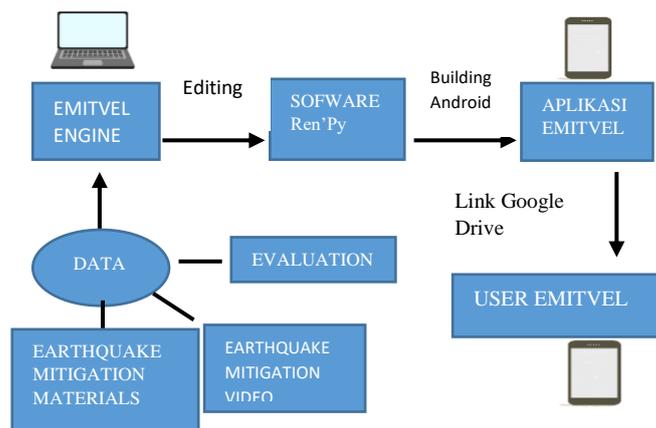
### 3.1.3 Product Design

EMITVEL's product design has four menu features, namely the start feature, the load feature, the preference feature, and the about feature. The start feature function is used to start EMITVEL. The load feature is used to play back the saved EMITVEL scene. The preference feature functions to set, and the about feature to find information on the application version. The EMITVEL menu display is as follows.

The first step is to find supporting materials and images. The supporting images here provide an overview of what is described in the earthquake disaster mitigation material in the EMITVEL application. Earthquake disaster mitigation materials are taken from the book Pendidikan Literasi Mitigasi Bencana di Sekolah (Juhadi & Herlina, 2020).



**Figure 2.** EMITVEL Application Framework Model



**Figure 3.** Conceptual EMITVEL architecture

The second step in compiling the EMITVEL application story is to create a script or storyline conceptualized with the main character's prologue scene explaining the earthquake disaster mitigation material. The storyline is created with each scene. The first scene is narration. The second scene is the introduction of the main character, the third scene explains the cause of the earthquake, the fourth scene explains pre-earthquake mitigation, the fifth scene explains mitigation during an earthquake, the sixth scene explains post-earthquake mitigation, the seventh scene shows a video, and the last scene is the scene answer questions.

EMITVEL (Earthquake Mitigation Visual Novel) is a learning media in the form of a visual novel that presents earthquake disaster mitigation material ranging from understanding earthquakes, causes of earthquakes, pre-disaster mitigation, during disasters, and after disasters, as well as videos about earthquake disaster mitigation and ten evaluation questions. In delivering the material, a character explains the material and images with sound and text. EMITVEL application is an Android-based application. Designing EMITVEL requires software (software) and hardware (hardware). The software used in developing EMITVEL is Ren'Py. Ren'Py is the leading software for making EMITVEL applications. At the same time, the hardware is a smartphone with a minimum specification of Android 5, namely a lollipop with a minimum of 1 GB of RAM and a minimum of 8 GB of internal memory.

EMITVEL application prototype has become an application that is highly structured from the application's appearance to the content of the EMITVEL application itself after producing a script and collecting materials, videos, and images. Here, unlike using video that already existed (Darmawanti, 2021; Schluß & Jehle, 2013), we produced the video as follows the EMITVEL prototype before it was revised.

### 3.1.4 Product Validation

At this stage, the researcher validated the initial product design to lecturers as media experts and elementary school teachers as practitioners to find the feasibility of EMITVEL media.

#### (1) The Result of Media Expert Validation

Media expert validation was performed by looking at aspects of software engineering, learning design, and visual communication. The assessment of the EMITVEL application was deemed sufficient, with details of 65 percent software engineering aspects, 61 percent learning design aspects, and 64 percent visual communication aspects, according to the recapitulation of the evaluation. Assessment can be seen in Table 8.

**Table 8.** Media Expert Rating

Aspect	Value (%)	Criteria
Software engineering	65	Currently
Learning design	61	Currently
Visual communication	64	Currently

Source: Research 2021

#### (2) The Assessment of Teachers

The assessment of teachers is carried out by investigating aspects of software engineering, learning design, and visual communication. The application has a valid category with specifics of teacher assessments, including software engineering aspects 69 percent, learning aspects 66 percent, and visual communication aspects 69 percent, according to the recapitulation of the EMITVEL application assessment. Assessment can be seen in Table 9.

**Table 9.** Teacher Rating

Aspect	Value(%)	Criteria
Software engineering	69	worthy
Learning design	66	worthy
Visual communication	69	worthy

Source: Research 2021

EMITVEL's media assessment on the aspect of software engineering gets a percentage of 69% with proper criteria.

EMITVEL's media assessment on the learning design aspect gets a percentage of 66% with feasible criteria. Details of the assessment of the learning design aspects can be seen in Table 11

**Table 10.** Software engineering Aspect

Software engineering Aspect	Frequency				
	1	2	3	4	5
Effective and efficient application in conveying the content of the material	-	-	1	9	1
The application makes it easier to understand the contents of the material	-	-	7	4	-
The application is easy to use in operation.	-	-	2	9	-
EMITVEL is an application needed in distance learning conditions due to the covid-19 pandemic to increase earthquake disaster preparedness	-	-	7	4	-
EMITVEL installs fine	-	-	2	9	-
Regular and systematic learning media programs in learning activities.	-	5	5	1	-
The instructions for using the application are complete.	-	-	6	4	1
EMITVEL can be reused to develop other learning media	-	-	9	2	-
In the operation of EMITVEL, there are no system errors	-	-	-	-	-
In the operation of EMITVEL, there are no system errors.	-	-	6	5	-
The design of the MITVEL program is straightforward.	-	-	8	3	-
EMITVEL is an application that is suitable for earthquake disaster mitigation education for elementary school students	-	-	8	2	1

Source: Research 2021

**Table 11.** Learning Design Aspect

Learning Design Aspect	Frequency				
	1	2	3	4	5
Clarity of learning objectives (formulation, realistic)	-	3	7	1	-
The relevance of learning objectives to the curriculum.	-	1	9	1	-
Scope and depth of learning objectives.	-	4	6	1	-
The accuracy of the use of learning strategies.	-	-	4	7	-
Interactivity.	-	-	6	5	-
Giving the motivation to learn.	-	-	9	1	1
Contextuality and actuality.	-	-	4	7	-
Completeness and quality of study aid materials	-	-	5	4	2
The suitability of the material with the learning objectives.	-	4	7	-	-
Material depth.	-	1	8	2	-
Ease to understand.	-	2	6	3	1
Systematic, coherent, transparent, logical flow.	-	2	7	2	-
Clarity of description, discussion, examples, simulations, and exercises.	-	1	7	3	-
Evaluation consistency with learning objectives.	-	-	10	1	-
Pemberian umpan balik terhadap hasil evaluasi.	-	-	5	6	-
Evaluation consistency with learning objectives.	-	-	6	5	-

Source: Research 2021

EMITVEL's media assessment on visual communication gets a percentage of 69% with proper criteria. Details of the assessment of visual communication aspects can be seen in Table 12.

**Table 12.** Visual communication Aspect

Visual communication Aspect	Frequency				
	1	2	3	4	5
EMITVEL is a communicative application according to the message and in line with the wishes of the target	-	-	8	2	1
Creative in the idea of pouring ideas	-	-	6	5	-
Simple and attractive application	-	-	7	1	3
Interactive application	-	-	10	1	-
Good application audio (narration, sound, music)	-	-	8	2	1
The images in the application correspond to the contents of the material	-	-	5	6	-
In-app videos are appropriate.	-	-	4	7	-
The characters in the app match	-	4	4	3	-
EMITVEL is a communicative application according to the message and in line with the wishes of the target	-	-	6	2	3

Source: Research 2021

### 3.1.5 EMITVEL Revision

The EMITVEL application contains weaknesses that need to be assessed, according to media professionals and high school teachers who evaluated it. The researcher studied and improved it based on the feedback of media professionals and teachers. The results of the revision can be seen in Table 13 and 14 as follows.

**Table 13.** EMITVEL App Revision From Media Expert

Validator	Suggestion
Pradika Adi Wijaya, S.Pd, M.Pd	The Preferences and About menus have no function and should be replaced with a more informative menu. For example, a menu that contains content sources from EMITVEL.
	The additional Skip and Auto features are removed because they can reduce student understanding due to the function of these features.
	If the application size is too large, it is better to reduce it to not burden students with installing the application.
	The image size in some scenes in EMITVEL is enlarged, and the main character image is removed.
	Add an image of a guide to the image of the elevator button in the mitigation material when an earthquake occurs.

Source: Research 2021

**Table 14.** EMITVEL App Revision From Practitioner

<b>Validators</b>	<b>Suggestion</b>
Ria Nurul Faiza, S.Pd. SD	Sentences on the material need to be corrected. The characters in EMITVEL are not suitable for elementary school children.
Dwi Puji Ratnawati, S.Pd. SD	Prologue characters are better replaced with more closed ones. The clarity of the language in the ground vibration source material is difficult to understand. The application size is too big.
Wahyu Purnama, S.Pd. SD	The material in the contents of EMITVEL is not coherent and not systematic and is not following the lesson plans that have been made.
Dina Andirahayu, S.Pd. SD	Changing the material that causes the vibration source to be material regarding the types of earthquakes according to their causes.
Sri Hartati, S.Pd. SD	The pictures in the pre-earthquake mitigation material need to be corrected.
Rahayu Dwi Nurcahyani, S.Pd. SD	RPP and EMITVEL contents do not match. Moreover, it is necessary to add material regarding the types of earthquakes caused by humans.
Hari Sulistiyani, S.Pd. SD	The learning materials are better; there are sources.
Kusumastuti Ratnaning Triworo, S.Pd. SD	Characters are better replaced with more attractive images. Explanatory images are made in PNG format so as not to interfere with the clarity of the image.
Guntur Cahyo Prasetyo, S.Pd. SD	EMITVEL content is aligned with the RPP.
Budi Astuti, S.Pd. SD	The understanding of EMITVEL content needs to be corrected in language to make it easy to understand. An example of the notion of socialization. As well as replacing the vibration source material with the material that causes earthquakes.
Ria Nurul Faiza, S.Pd. SD	It is better if the image can move, for example, on the movement of faults.
Dwi Puji Ratnawati, S.Pd. SD	In the mitigation learning material, it is necessary to add pictures when an earthquake disaster occurs in the seventh order.

Source: Research 2021

(1) Menu

Before being revised, the preferences and about features were deemed not to have maximum functionality because the preferences menu functions to adjust the volume level. With such a function, it can be done directly via a smartphone. Moreover, the About feature function provided information about the EMITVEL application and the software maker, Ren'Py; with such a function, it did not provide a maximum value. Therefore, the preferences and about menus were replaced with the source and quit features. The image can be seen in Figure 4. After being revised, the menu features are a start, load, source, and quit. There are two additional

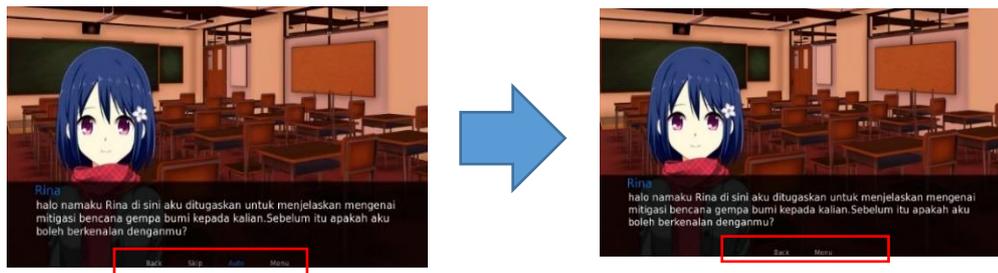
features. The source feature function is used to view the source of the material and images in the EMITVEL application, while the quit feature is used to exit the application.



**Figure 4.** EMITVEL Menu Display Before and After Revised

## (2) Additional Features

Before the revision was conducted, additional features were back, skip, auto, and menu. The skip and auto features were omitted because the function of these features can hinder students' understanding when playing EMITVEL. The image can be seen in Figure 5. Additional features after being revised are back and menus so that additional features will function effectively and efficiently.



**Figure 5.** Additional Features Before and After Revision

## (3) Application Size

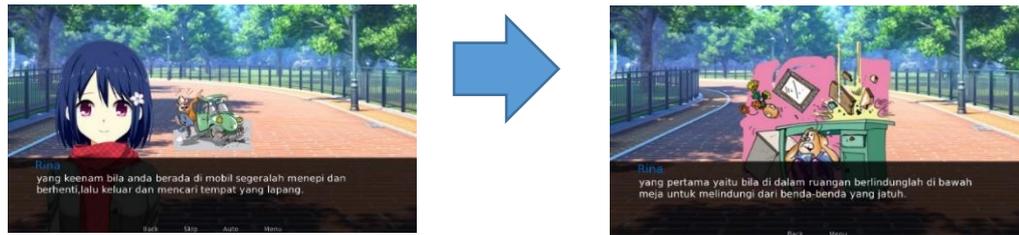
The application used to be 126 MB in size before the revision. The EMITVEL application was 67 MB after revision. The application's size is reduced so that large application sizes do not burden users.

## (4) Image Size

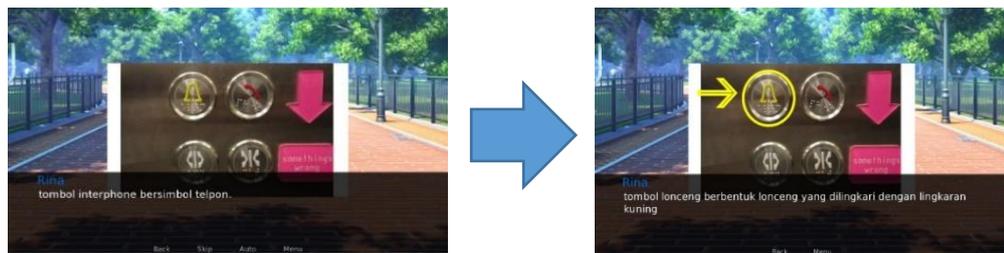
Prior to the revision of the image size, the contents of the EMITVEL application were 213 x 198 pixels. After the revision, the image size is Kd 500 x 419 pixels. This was done so that the image looks clear. The image can be seen in Figure 6.

## (5) Image Instructions

The image, before being revised, looked like there was no sign to explain or show something. After revising the image, circles, and arrows are added to indicate something. The image can be seen in Figure 7.



**Figure 6.** Size Before and After Revision



**Figure 7.** No Hints Scane Before and After

### 3.1.6 Discussion From Development Process of EMITVEL (Earthquake Mitigation Visual Novel)

In the software engineering aspect assessment, almost all grades received scores of 3 and 4, and there was only 1 statement that received a value of 2, namely regarding regular and systematic learning media programs in learning activities, which can be seen in Table 10. Regular and systematic learning is the essence of success in conducting EMITVEL media trials. Learning disaster mitigation using EMITVEL media is carried out irregularly and not systematically because it needs to follow the lesson plans made by researchers. This agrees with the opinion (Siregar & Nara, 2010) that learning is an activity carried out consciously, directed, and planned, with the goal that students follow the learning process well. These goals have been set before learning is carried out, and learning plans are made so that the implementation of controlled learning, both content and time, and at the time of learning and learning outcomes, follows what is desired. This is a validator's consideration in assessing the feasibility of EMITVEL media.

In assessing the learning design aspect, the average statement gets 3 and 4. However, there is an assessment that gets a value of 2 related to the suitability of the material with learning objectives, depth of material, ease of understanding, systematic, coherent, logical flow, clarity of description, and discussion. The assessment can be seen in Table 11. The first is related to the suitability of the material, which is irrelevant to the learning objectives in EMITVEL media. Because, indeed, the material in EMITVEL is not contained in the elementary school syllabus and only relates material in EMITVEL to material relevant to Basic Competency. Core Competency and Basic Competence are referenced in implementing learning, whether successful or not. If students can achieve the standards determined, they are declared complete. The second is related to the clarity and depth of the material to facilitate student understanding in systematic learning. Based on this deficiency, the researcher added material and sources to EMITVEL's media content and aligned the material on EMITVEL with

the material in the lesson plans. The Learning Implementation Plan is a guideline for implementing learning because it contains Core Competencies, Basic Competencies, achievement indicators, learning objectives, materials, methods, learning activities, and an assessment of learning outcomes. Several things need to be considered in using media for learning purposes, namely accuracy with learning objectives, support for the content of learning materials, ease of obtaining media, and teaching skills in using it, according to students' level of thinking. The validator considers this in determining the assessment.

In assessing the visual communication aspect, the average statement gets a value of 3 and 4, and there is 1 statement that gets a value of 2 related to the main character in EMITVEL media. The assessment can be seen in Table 12. The main characters are replaced with characters considered appropriate for elementary school children and following the appearance of teachers in Indonesia in general, namely the character values of teachers in Indonesia because the main character in EMITVEL media has an essential role in carrying out his role.

A small-scale trial of MITVEL media was carried out using a distance learning model. Some obstacles can affect learning, so learning needs to run more effectively. However, there are no improvements related to EMITVEL media but only related to weaknesses or obstacles in carrying out the learning process of earthquake disaster mitigation with EMITVEL media. Because at this stage, the EMITVEL media has been said to be appropriate as a learning medium for earthquake disaster mitigation in the assessment. Revisions have been carried out based on the validator's suggestions.

Moreover, at this stage, only the first obstacle is that student scores from evaluations at EMITVEL cannot be recorded automatically by the teacher. The solution is that the teacher gives directions to students to take photos of their grades, then sends them to the WhatsApp class group so that the teacher can recapitulate to map the competence of earthquake disaster mitigation for each student. The second is the need for more control over the learning process for earthquake disaster mitigation. This learning is carried out independently using a distance learning model, so students need help understanding the material. The solution is that questions or students who need clarification about the material can be asked through the class WhatsApp group so the teaching teacher can answer them. The teacher monitors learning through the class WhatsApp group. The third is that students need help understanding the procedures for using EMITVEL media. The solution is that the module on how to use EMITVEL media can be shared on WhatsApp group classes, or the procedures for using EMITVEL media can be explained directly by the teaching teacher in the class WhatsApp group because the teaching teacher has learned these procedures when conducting the EMITVEL media assessment. These three obstacles are included in the difficulties in the student learning process, which causes learning to be not optimal. Learning difficulties are a condition in the learning process where students cannot achieve maximum learning results because of obstacles.

Sufficient criteria and feasible criteria are obtained based on the analysis and discussion of the feasibility assessment. The input and suggestions provided by the validator are used as guidelines for improving the EMITVEL media. The assessment results have reached the indicators set by the

researcher, namely, EMITVEL media is worthy of being an earthquake disaster mitigation learning medium for elementary school students.

### 3.1.7 Advantages and Disadvantages of EMITVEL (Earthquake Mitigation Visual Novel) Media

EMITVEL media is an Android-based media designed for e-learning, and EMITVEL is an audio-visual media for elementary school earthquake mitigation learning. In developing EMITVEL media, there are advantages and disadvantages when this media is tested on students. As follows:

#### (1) Advantages of EMITVEL media

First, Android-based EMITVEL media makes students interested and motivated to participate in earthquake disaster mitigation learning even though online learning is done. Audio-visual media presents engaging learning, namely learning that contains elements of images and sound, and EMITVEL media has the concept of a visual novel, material that is abstract and difficult to understand will be easier to describe clearly and quickly (Leetian, 2013). Motivation is a complex concept closely related to the 'will to learn' and includes self-esteem, self-ability, effort, self-regulation, locus of control, and goal orientation (Harlen, 2003).

Second, in this era, technology is needed to improve effective and creative learning, including Android-based learning. According to Speckmann (2008), android has complete facilities for everyday life; one example is learning activities. Means (1993) also agree that strategies for using technology for learning can be used in science, technology, engineering, and mathematics learning environments. This technology has a positive nature and impact (Lei, 2007). EMITVEL media can be used as a medium for learning different concepts in the future.

Third, learning about earthquake disaster mitigation can be done at any time. Because this learning is independent, and every student has the EMITVEL application. So, students can do learning and repeat material independently using their respective smartphones. The current situation for students' smartphone usage is very high (Putranta, 2021). Even so, students cannot use smartphones positively and optimally for student literacy. Therefore, there is a need for supervision and proper treatment in using smartphones to learn optimal earthquake disaster mitigation.

#### (2) EMITVEL media disadvantages

In testing the EMITVEL application for students to find out the deficiencies in the EMITVEL application. 1) The EMITVEL application cannot be monitored directly by the teacher because there is no meet feature. In other words, earthquake disaster mitigation learning during the Covid 19 pandemic was carried out independently with the smartphones of each student. If you have questions, you will be asked on the class WhatsApp group for teachers. 2) In playing this application, more moving images or animations must be needed to explain the material. 3) the video in the EMITVEL application cannot be stopped, sped up, or slowed down. 4) The visual images in the MITVEL application contain images that are not suitable. 5) In the learning

process, the teacher must first simulate playing EMITVEL with students by sending procedures for using EMITVEL media in the WhatsApp group. Because in playing this media, you have to know the procedures in the game to understand the contents of EMITVEL.

In previous studies, media in the form of visual novels can change the positive character of students (Hikam et al., 2013). Moreover, from other studies, visual novels play a significant role and influence students' understanding of the material (Chalysta & Damayanti, 2020).

#### 4. Conclusion

In this study, the EMITVEL media is considered appropriate as an earthquake disaster mitigation media for elementary school students with the condition that media practitioners and experts revise it.

Based on the results of the research that has been done, some suggestions will be given by the researchers, such as follows.

- (1) The EMITVEL application can be used during distance learning or face-to-face learning.
- (2) In conducting distance learning using EMITVEL, the teachers should first explain the procedure for using the EMITVEL application.

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