APPLICATIONS KNOW PREPARATION FOR EARTHQUAKES FOR ELEMENTARY SCHOOL STUDENTS

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ABSTRACT

This research is entitled the application of recognizing preparation for earthquakes for elementary school students. The goal is to produce an application that can help students recognize preparation for earthquakes. The resulting application is made using Adobe Flash CS 6, and the Actionscript 3 programming language. This application can run well on Android smartphones, and personal computers/laptops. There were 20 students who were the subjects of this study, and they came from elementary schools Negeri 105270 Pujimulio, Deli Serdang, North Sumatra. Students who are tested beforehand (pre-test) their knowledge about preparation in dealing with earthquakes. After that students are asked to use the resulting application. After that, students are tested again for their knowledge (post test). So from the pre test and post test carried out, get test results that show an increase in students' knowledge in learning know how to prepare for an earthquake.
Keywords: Applications, Earthquakes, Elementary School, Students.

1. Introduction

Indonesia is an archipelagic country. The country is located between four tectonic plates. This plate consists of the Indo-Australian, Eurasian and Pacific plates. This causes the country to have a volcanic belt such as volcanic mountains, and the potential for volcanic eruptions, tsunamis, floods, earthquakes, and landslides. Earthquake disaster is a concern in this study. Because earthquakes are the most frequent disasters in Indonesia(Djunarsjah & Putra, 2021; Kurnio, et al., 2021).

In the last 15 years, earthquakes occurred in several areas that claimed many lives. For example, in 2004 the Aceh region experienced an earthquake with a magnitude of 9.1 on the Richter Scale, and then in 2006 the Yogyakarta region with a magnitude of 5.9 on the Richter Scale(Rahiem, et al., 2021).

According to the National Disaster Management Agency, students in schools have a 75% risk of becoming victims of an earthquake(Kesumaningtyas, et al., 2022). Schools or Madrasas must be prepared to face disasters, because students spend more time in class to do learning. So it is felt that students must know about preparation for earthquakes to avoid casualties at school. Many preparations for earthquakes, also known as disaster education, have been carried out. Such as demonstrating live, through books, animations, applications and much more(Li & Zhou, 2021; Li, et al., 2022; Putra et al., 2022; Rahmadoni et al., 202).

In this study, preparation for earthquakes is presented through the application. The goal is to introduce preparation for earthquakes to elementary school students by integrating multimedia concepts. Multimedia concepts consisting of elements of text, sound, images, animation, and video can produce a more dynamic and interactive information presentation. So that the application made is expected to increase student interest in learning to use it, and provide information about preparation for earthquakes(Toyoda, et al., 2021; Ghazala & Elshall, 2021; Itamiya, 2021; Alfath et al., 2022).

2. Literature Review
a. Adobe Flash CS 6

Since being acquired by the giant company Adobe, the multimedia software. Macromedia Flash changed its name to Adobe Flash. This acquisition could also be a sign that the prospects for making animation using flash will get better.

Flash has been introduced since 1996. Some people use it to create animations for websites, company profiles, interactive CDs and games. The use of flash has developed in the manufacture of features for mobile devices such as mobile phones.

*Adobe Flash CS 6*is the latest version of the previous version of Adobe Flash CS 5. Adobe Flash Professional CS 6 has features that can enhance the development of IOS and Android devices. To build applications with Adobe Flash Professional CS 6, especially in creating vector graphics and design elements, you can use drawing tools and can add media elements from outside, such as audio, video and images into the document. Then to determine how and when the designed elements appear, we can use the Timeline to organize them. Adobe Flash Professional CS 6 also has components, namely, Menu Bar, Toolbox, Timeline Panel, Stage, Properties Panel, Actions Panel, Color Panel and Library Panel(Ilmi, et al., 2021; Voutama, et al., 2021).

b.   Actionscript 3

ActionScript is the programming language in Flash. With ActionScript, we can control objects using specific code. To display ActionScript, we can do it in several ways, namely, by accessing the Windows menu and then Actions. By pressing the F9 key, then selecting the Actions tab(Niibori, et al., 2012).

ActionScript is programming that works in Adobe Flash applications that are used to create animations or interactions, ActionScript allows to create action-oriented instructions (perform commands) and logic-oriented instructions (analyze problems before executing commands). ActionScript typing is done in an Actions panel by pressing the F9 key. ActionScript can be applied to actions on frames, buttons and movie clips. The main function of ActionScript is to provide connectivity to an object, namely by writing commands in it.

3. Research Methods

    a.   Research design

        The following is the research design contained in the study:
1) Identifying the problem
2) Literature review
3) Setting research questions
4) Choosing the study design
5) Deciding on the sample design
6) Collecting data
7) Processing and analyzing data
8) Writing the report

    b.   Research Subject

        The subjects of this study were elementary school students Negeri 105270 Pujimulio, Deli Serdang, North Sumatra. The subjects were 20 people, consisting of 10 men and 10 women.

    c.   Data Collection Technique

        To collect data, researchers conducted interviews, observations, and distributed questionnaires. The data collected is processed to obtain information about the needs of application users. The data will also be processed to conclude the results from before, and after the application of the application.

4. Results and Discussions

1. Minimum Specification Requirement

There are three requirements in completing this application, namely:

  a. Android Smartphone

    The android smartphone used for testing has the following specifications:
1) CPU : MSM7625A 800 MHz, Adrena 200

2) Internal Memory : 512 MB RAM, 1 GB ROM
3) External Memory: 2GB
4) Operating System : Android OS, V4.0.4 (Ice Cream Sandwitch)
5) Screen Type: TFT Capacitive Touchscreen
6) Screen Size: 480 x 320 pixels

b. Hardware
The hardware used has the following specifications:
1) Processor : Intel® Celeron® N4000 CPU @ 1.10GHz 1.10 GHz
2) Memory: 4GB DDR 3
3) Hard disk: 500 GB
4) Display : 14 Inch WXGA (1366 X 768)
5) Sound Card : Integrated
6) Video Type : Intel® HD Graphics up to 805 MB
7) Keyboard, Mouse, Speaker, Headset
8) Printer

c. Software
The software used in the application to recognize preparation for earthquakes is:
1) *Adobe Flash Professional CS 6*
2) *Adobe Audition CS 6*

2. Apk File Creation

After making an application about preparing for an earthquake through Adobe Flash Professional CS 6, this application cannot be used directly on an android smartphone. Therefore, this application must first be converted into a file with the Apk extension, so that it can be used on an android smartphone. The steps taken to convert it into a file with the Apk extension:
a. Have Adobe Flash Professional CS 6 software already installed.
b. Prepare the project you want to publish.
c. Select the file menu, select Publish Settings.
d. The Publish Settings screen will appear.
e. Select the Air 3.2 for Android target and select the ActionScript 3.0 target
f. On the Deployment tab, select certificate, select create to create a certificate and password to use. Enter the password for the certificate that was created.
g. Under Android deployment type, select device release.
h. Under AIR runtime, select Embed AIR runtime with application.
i. On the Icons tab, select the icon to use.
j. On the Permissions tab, check internet.
k. On the Languages tab, check Engish.
l. Then select publish.

3. Application Testing and Discussion
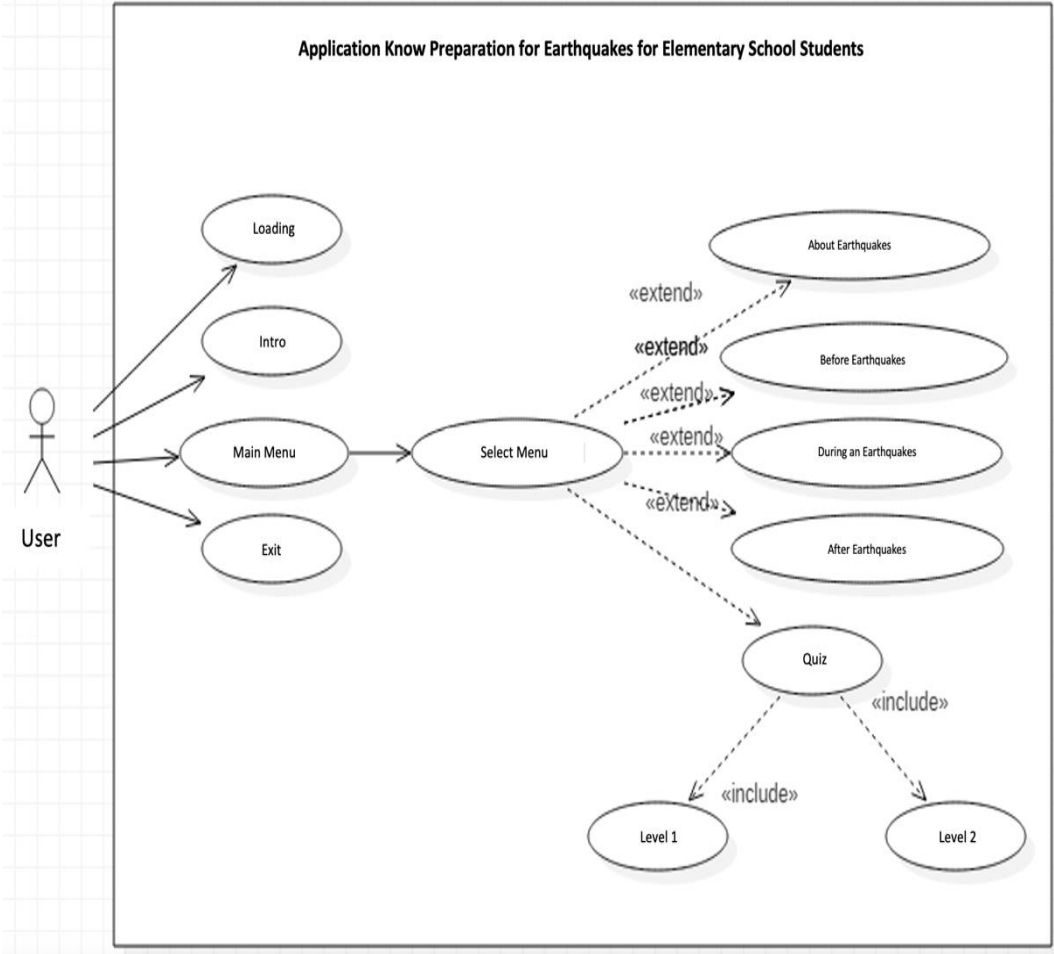
Following:

Fig 1. Use Case Diagrams

a. Loading View

The loading display is used as the initial display when the application recognizes preparations for an earthquake. Users have to wait until the loading process is complete to go to the next screen.

Fig 2. Display Results Loading

b. Intro View

The intro view is used as a display that appears after the loading process is complete. This loading display is used for a brief explanation of the application regarding preparation for an earthquake.

Fig 3. Intro View

c. Main Menu Display

The main menu display is a display that contains the main menu, namely, a menu about earthquakes, before, during and after earthquakes and quizzes.

Fig 4. Main Menu Display

d.   Display About Earthquake
     The menu display about earthquakes serves to go to the menu display about
earthquakes.

Fig 5. Menu Display About Earthquake

e.   Pre-Earthquake View
     The menu display before the earthquake serves to go to the menu display before the
earthquake.

Fig 6. Menu Display Before Earthquake

f.   Display During Earthquake
     The menu view during an earthquake serves to go to the menu view during an
earthquake.

Fig 7. Menu Display During Earthquake

g.   Appearance After Earthquake

The menu display after the earthquake serves to go to the menu display after the earthquake.

Fig 8. Menu Display After Earthquake

h. Level 1 Quiz Display

Quiz view serves to go to the quiz menu view. This quiz is divided into two levels, level 1 and 2. This quiz contains 10 questions.

Fig 9. Level 1 Quiz Display

i. Level 1 Quiz Question Display

Figure 10. Level 1 Quiz Question Display

j. Level 1 Quiz Answer Key Display

Fig 11. Level 1 Quiz Answer Key Display

k.   Level 1 Quiz Results Display

Fig 12. Level 1 Quiz Results Display

l.   Level 2 Quiz Display

Fig 13. Level 2 Quiz Display

m. Level 2 Quiz Question Display

Fig 14. Level 2 Quiz Question Display

n. Level 2 Quiz Answer Key Display

Fig 15. Display Explanation of Level 2 Quiz Answers

o. Level 2 Quiz Results Display

Fig 16. Level 2 Quiz Results Display

6. Evaluation of Applications Knowing Preparation for Earthquakes
a. Testing With Questionnaire

Evaluation of the application regarding preparation for an earthquake was carried out by applying this application and giving questionnaires to 20 children who used it. Children who receive a questionnaire can fill out the questionnaire accompanied by a parent or teacher. Questionnaires were distributed 2 times to the 20 children, before using this application (pre test) and after (post test)(Yildiz, et al., 2020).

Questionnaire distributed to 20 children, consisting of 10 questions and measured using a Likert scale(South, et al., 2022). The Likert scale is a rating scale between 1 (one) to 4 (four) with the following descriptions:
1) Number 1 (one) states strongly disagree.
2) Number 2 (two) states disagree.
3) Number 3 (three) states agree.
4) Number 4 (four) states strongly agree.

Here are 10 questions given to 20 children through a questionnaire, before using the application (pre test) and after (post test).
1) Are students able to learn about preparing for an earthquake?
2) Are students able to work together with their friends in studying preparation for an earthquake?
3) Are students sleepy in class?
4) Do students enjoy studying preparation for earthquakes?
5) Do students like the tools used in studying preparation for an earthquake?
6) Have students been able to identify all the preparations for an earthquake?
7) Can students answer the questions correctly that have been provided in the form of level 1 and 2 quizzes?
8) Can students identify about earthquakes, before, during, after the earthquake shown?
9) Do students still want to continue the lesson even though the lesson time has run out?
10) Do students ask to use the same learning aids again?

Questions 1 and 2 were used to measure students' independence, questions 3 to 5 were used to measure students' independence, questions 6 to 8 were used to measure students' understanding and questions 9 to 10 were used to measure students' motivational aspects.

b. Questionnaire Results Before (Pre test) and After (Post test) Using the Application
The results of the 2 questionnaires distributed before and after using the application about preparing for an earthquake can be seen in the table below:

Table 1 - Pre Test and Post Test Results

No.	Name	Pre-Test	Post Test
1.	User 1	22	38
2.	User 2	20	35
3.	User 3	20	34
4.	User 4	21	32
5.	User 5	19	33
6.	User 6	20	35
7.	User 7	19	33
8.	User 8	21	33
9.	User 9	21	33
10.	Users 10	22	34
11.	User 11	21	33
12.	User 12	20	30
13.	User 13	20	33
14.	User 14	20	33
15.	User 15	19	35
16.	User 16	18	32
17.	User 17	19	31
18.	User 18	21	33
19.	User 19	20	33
20.	Users 20	20	35

The following is a graph of the results table before using this application (pre test) and after (post test):
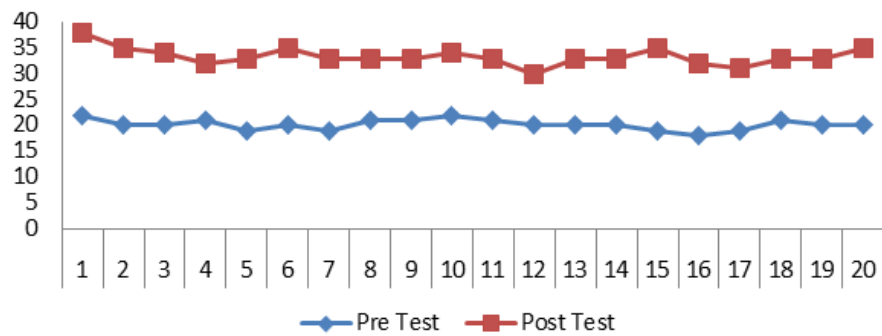
Fig 17. Graph of Differences in Pre Test and Post Test Results

From the results of the graph, it can be seen that there are increasing differences in some children after and before using the application to recognize preparation for earthquakes. Because of this, the application to know how to prepare for an earthquake has a very good influence on children aged 8 to 12 years, in learning independently at school and at home.

5. Conclusion

Applications about preparing for earthquakes have been successfully created and applied to students in elementary schools. The results of the application of this application indicate an increase in knowledge in preparation for earthquakes. This application can run on android smartphones, and PCs / laptops. Users can use their gadgets to get the information presented. It is highly recommended the presence of parents or teachers to directly guide students in the use of the application, and get optimal results.

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