CHAPTER 1

INTRODUCTION

1.1 Background

Indonesia's geographical location traversed by three tectonic plates in the world, namely, the Eurasian Pacific plate and the Australian plate, has resulted in Indonesia being one of the countries with high potential for earthquake disasters, tsunamis, volcanic eruptions, and land movements. The tectonic activity caused volcanoes along the islands of Sumatra, Java Bali-Nusa Tenggara, north Sulawesi-Maluku, and Papua (Maizar et al., 2021). This phenomenon can impact the area traversed so that the intensity of natural disasters increases, such as earthquakes and volcanic eruptions (Abbas & Asrina, 2022).

Earthquakes are earth vibrations generated by the sudden release of energy stored and trapped in the earth's crust in all directions from the epicenter (Pangestu et al., 2022). Earthquake is always unpredictable. Nevertheless, we can still reduce and prevent its negative impacts through earthquake disaster preparedness. Disaster preparedness is one stage of broader activities known as disaster management. Disaster management steps are preparedness, response, recovery, assessment, prevention, and mitigation (Kurniawati, 2017).

Disaster preparedness involves the preparation of a counter-disaster plan, forecasting and warning of the disaster, and maintenance of resources needed

During and after a disaster, and training of the related personnel, Earthquake disaster preparedness should be implemented, especially for children, because they are the most at risk for the negative effects of disaster. Children are psychologically vulnerable and may develop post-traumatic stress disorder or related symptoms. They are physically susceptible to death, injury, illness, and abuse (Winarni et al., 2021).

During ten years, there were approximately 108 earthquakes in Banyuwangi regency (BPBD, 2022). The earthquake occurred with the epicenter located in the Indian Ocean at coordinates 9.51° South Latitude and 114.01° East Longitude, with a magnitude (M5.3) at a depth of 10 Km, approximately 149.3 km south of the city of Banyuwangi, Banyuwangi Regency, East Java Province on August 15, 2020, according to The National Agency for Disaster Countermeasure (BPBD) this earthquake is a tectonic earthquake with no potential for a tsunami, real earthquake vibrations were felt in people's homes.

Between 1998-2017, earthquakes caused nearly 750,000 deaths globally, more than half of all deaths related to natural disasters. It is estimated that around 800 earthquakes occur in a year with a magnitude of 5-6. (Abbas & Asrina, 2022). More than 125 million people were affected by earthquakes during this period, meaning they were injured, homeless, displaced, or evacuated during the emergency phase of the disaster (WHO, 2022). According to The National Agency for Disaster Countermeasures (BNPB), the incidence of natural disasters will continue to increase yearly. In the last 10 years (2012-

2022), there have been 216 cases of earthquakes with a total of 637 missing and dead victims, 8,687 injured victims, 495,855 refugees, 602,223 units, residents' houses were damaged, and 131 public facilities were damaged (*Data Informasi Bencana Indonesia*, 2021). According to The National Agency for Disaster Countermeasures, several earthquakes have occurred in the East Java region in the last three years; East Java is ranked third after Central Java and West Java, with the number of disaster cases in Central Java 726 cases, West Java 390 and East Java 339.

The Banyuwangi region is prone to earthquakes because it is close to the megathrust zone (the meeting of the Indo-Australian and Eurasian plates) and the back-arc. The arrangement of the plates in the Banyuwangi area is adjacent to the trajectory of the earthquake path, namely the megathrust zone (the meeting of the Indo-Australian and Eurasian plates) in the Indian Ocean, which is south of Banyuwangi. Banyuwangi has the longest coastline in East Java, around 175 km. Therefore, Banyuwangi has the potential to be shaken by a large earthquake accompanied by a tsunami (Ghofur et al., 2021).

Based on a preliminary study conducted by researchers on November 17, 2022, with 66 students in 5th grade 5^{th} of elementary school Klatak Banyuwangi, it was found that 100% of students had never received earthquake preparedness materials and training. Some students said that they remembered feeling an earthquake when they were in grade 3 of elementary school.

Disaster preparedness involves the preparation of a counter-disaster preparedness involving three phases: pre-disaster, the phase when a disaster

occurs, and post-disaster (I Aristanti, 2019). The pre-disaster phase consists of preparedness, early warning, and mitigation. Then, when a disaster occurs in this phase, the activities carried out are disaster emergency response, in which the goal is to "save more lives." According to PP No. 11 of 2014, the steps are carried out in conditions emergency response include:

1. Quick and accurate assessment of location, damage, and resources so that the magnitude of the disaster can be known and estimated, the area affected, and the approximate extent of the damage.
2. Determination of disaster emergency status.
3. Based on the initial assessment, the level of disaster can be estimated so that emergency status can also be determined.
4. Rescue and evacuation of people affected by disasters the latter, namely after a disaster, the main activity is targeted at recovery of better living conditions and community livelihoods (build back better) even with all the limitations. After the disaster and the emergency response process have passed, the next step is rehabilitation and reconstruction.

The 2021 Disaster Education Consortium explained that the earthquake on May 12, 2008, in Wenchuan, China, when the disaster occurred during school hours, had a major impact which killed approximately 5,335 students (Konsorsium Pendidikan Bencana, 2021). Disaster preparedness education for children was conducted through formal or non-formal education. These programs for children in schools have strengthened resilient communities by enabling them to withstand shocks, cope with emergencies when they occur,

and bounce back from disaster impact. The characters had funding for preparedness activities and a school-based emergency preparedness coordinator. The aspects were positively associated with school preparedness measures, including the perceived level of preparation, availability of emergency equipment and supplies, the extent of interagency coordination, and provision of in-service training (Winarni et al., 2021).

Providing education needs assistance with interesting media. Students still in elementary school with the characteristics of still thinking relatively concretely, based on the theory that children aged 9-13 have critical thinking, are curious about everything in depth, and like to ask questions (Uge et al., 2019).

Disaster preparedness education can be carried out early on through a school disaster preparedness program so students can know how to save themselves when a disaster occurs. Several ways or media can be presented to support information about disaster preparedness, including learning media in the form of books, direct field simulations, power points, videos, and animated videos (Ilmiah et al., 2022).

Through animated video, media can make it easier to understand the subject matter. Animated video is a film that originates from hand-drawn processing with appropriate audio so that it becomes an image that moves according to a predetermined path at any given time. The object in question can be human images, text writing, animal images, plant images, buildings, etc. (Darmawan, 2020).

So, this animated video media is an audio-visual media that combines animated images that have been selected and then made to move according to the time count, and the appropriate audio is added. This animated video has many benefits, including it can be used by teachers to shorten the time in delivering material to students. It can minimize errors during live demonstrations in front of the class. It can attract more students' attention and interest because the media display is made attractive and can be utilized by the teacher to present authentic problems in increasing the effectiveness of the teaching and learning process. The teacher can arrange the appearance of the animated video according to his wishes (Mahmudah & Fauzia, 2022).

The researcher made initial observations by asking how the earthquake happened. Besides, the school had never provided an animated disaster simulation video, and no learning media was used to increase disaster preparedness knowledge and skills in the school environment. Elementary school Klatak Banyuwangi also does not have an evacuation route and an early warning system in the event of a disaster, seeing as the research site has a 2-story building and is less than 2 km from the sea.

The ability to understand something is a basic ability that students must have. It is because the ability to understand is a basic skill in the revised Bloom taxonomy (Gunawan & Paluti, 2017), which is the basis for students to develop themselves so that they can apply, analyze (analyzing), evaluate (evaluation) until finally the ability to create (creating) (Hadi, 2017). Knowledge and skills are needed related to understanding that focuses on knowledge to survive as a

survivor and to know the abilities possessed by each individual to deal with the disaster that will occur (Widiastuti et al., 2022).

Animated videos are a relevant medium for developing disaster preparedness knowledge and skills. Animation can provide a learning experience and greater interest than reading textbooks or power points because the material presented is audio-visual and movement, so that it can give an impressive impression to the audience. Video is very effective for elementary school students still in the concrete operational stage (Parlindungan et al., 2020).

Developing earthquake preparedness knowledge and skills is by displaying a simulation animation video that contains earthquake preparedness both pre-disaster, during a disaster, and post-disaster. Students will be interested in learning using animated videos that can be contained in a social studies subject (IPS) that studies natural appearances and some examples of natural disasters. The video must be well understood by students; even if it is necessary to play it, it can be repeated depending on the students' needs. Video repetition can be done live/twice broadcast in a day or played on another day to remind students about the material in the video (Suarez, 2015). Thus, selecting and using effective and efficient media is vital in supporting learning. Animations are more engaging for children in assessments (Atesgoz & Sak, 2021).

It is necessary to research "The Effect of Earthquake Simulation Animation Videos on the Knowledge and Skills of Earthquake Disaster Preparedness in 5th Grade Elementary School Klatak Banyuwangi 2023". To

reduce the risk of earthquake disasters and the limitations of schools in implementing them.

1.2 Formulation of the Problem

Is there any effect of the disaster simulation animated videos on the knowledge and skills of earthquake disaster preparedness for 5th-grade elementary school Klatak Banyuwangi 2023?

1.3 The Objective of the Study

1.3.1 General Purpose

Determine the effect of earthquake disaster simulation animated videos on the knowledge and skills of earthquake disaster preparedness for 5th-grade elementary school Klatak Banyuwangi 2023.

1.3.2 Specific Aim

1. Identify knowledge and skills in earthquake disaster preparedness before being given an animated video of an earthquake disaster simulation to 5th-grade elementary school Klatak Banyuwangi 2023.
2. Identify knowledge and skills in earthquake disaster preparedness after being given an animated earthquake simulation video for 5th-grade elementary school Klatak Banyuwangi 2023.
3. Analyzing the effect of earthquake disaster simulation animated videos on the knowledge and skills of earthquake disaster preparedness for 5th-grade elementary school Klatak Banyuwangi 2023.

1.4 Expected Result

1.4.1 Theoretical

Can increase knowledge, especially in disaster nursing, with data showing the effect of giving an animated earthquake disaster simulation video on knowledge and skills in 5th-grade elementary school Klatak Banyuwangi 2023.

1.4.2 Practical

1. For respondents

   Can increase knowledge and skills in earthquake disaster preparedness.

2. For institutions

   This research can increase knowledge in disaster nursing courses and be a reference in further research.

3. For further researcher

   Researchers can add knowledge and insight about the effect of earthquake disaster simulation animation videos on knowledge and preparedness skills in dealing with earthquake disasters.

4. For research sites

   It is expected to receive knowledge and information about the effect of an earthquake disaster simulation animation video on the knowledge and skills of students' preparedness in dealing with earthquake disasters.

CHAPTER 2

LITERATURE REVIEW

2.1 School Age Concept

2.1.1 Definition of School Age

The World Health Organization (WHO) states that school-age children are 7-15 years old. One hundred eighty children from grades 5 and 6 performed a recall task within instructional conditions: serial recall, standard free recall, labeling free recall, and labeling cued recall (Rossi, 2017). Children will begin to learn to form a concept, see a relationship, and solve problems in concrete situations (Khaulani et al., 2020).

As children develop and gain experience with public evaluation and internalize standards for evaluation, the presence and judgments of an actual audience may become less critical to the experience of these two emotions (Seidner et al., 2016). This time is referred to as the mature age for children to learn. It is because children want to master the new skills given by the teacher at school, and one of the signs that this period of achievement begins is that the child's attitude towards the family is no longer egocentric but objective and empirical to the outside (Sabani, 2019).

2.1.2 Characteristics of School Age

Every child has characteristics at school age. Wachowiak and Clements (1993) suggest that there are three characteristics, namely, at grade

One and grade two. Early experience in elementary school, namely in grades one and two, the children have several characteristics in their development. Among others: 1) Children are more active in activities and easily find things that make them feel happy 2) Children start to like the work that is given to them either from school, parents, other people, or even from their peers using their own hands 3) Children can show a great sense of pride if they can complete their work 4) Children have limited time on interests and get bored easily 5) Children have feelings that are easily hurt if they get unpleasant treatment for themselves (Erkman et al., 2010).

Then, at the third and fourth-grade levels, children have several characteristics at this stage of middle school age development, namely at the third-grade and fourth-grade levels. Among other things: 1) Children already have good eye and hand coordination 2) Children know if there are differences in each person 3) Children begin to separate themselves or make friends based on their gender 4) A child can start working with a group of peers 5) Children begin to have the ability to criticize and evaluate themselves.

Then the last is the fifth and sixth grade levels, in the final stages of elementary school age, a child has the following developmental characteristics: 1) Children can concentrate based on the interests they want 2) Things that children are interested in are related to activities related to their gender 3) Girls' physical and emotional development is more mature

than boys 4) Sometimes children like to be themselves and away from adult influences (Erkman et al., 2010).

2.1.3 Developmental Stages of School-Age

Development is related to an integrated personality (Khaulani et al., 2020). The development phase of elementary school children can be seen from several main aspects of the individual child's personality, namely aspects 1) physical-motor, 2) cognition, 3) socio-emotional, 4) language, and 5) religious morals, which will be explained in the following child development phase (Setyorini & Izzaty, 2016):

1. Physical-motor

   The physical growth of children at primary school age is marked by becoming taller, heavier, and stronger than when children were in early childhood/kindergarten. It can be seen in changes in the skeletal system, muscles, and movement skills. Children are more active and strong in physical activities such as running, climbing, jumping, swimming, and other outdoor activities. Children carry out this physical activity to train coordination, motor skills, and body stability and channel accumulated energy.

2. Cognition

   Aspects of cognitive development are developments related to cognitive abilities possessed by children, namely the ability to think and solve problems. Elementary school-age children have unique thinking

characteristics. Their way of thinking is different from preschoolers and adults. How to observe the surrounding environment and organize the world of knowledge they get is different from preschoolers and adults. Children will begin to learn to form a concept, see relationships, and solve problems in concrete situations (Khaulani et al., 2020).

3. Socio-emotional development

   The hallmark of this phase is the increasing intensity of the child's relationship with their peers, and the child's dependence on the family decreases. In this phase, the relationship or social contact is better, so children prefer to play and talk in their social environment.

4. Language development

   Children's language development will develop from the beginning of elementary school and reach perfection at the end of adolescence. One of the factors that influence the language development of elementary school children is environmental factors.

5. Religious Moral Development

   The family environment and the wider social environment outside the family are the center of moral development lessons for children. The concept of moral development explains that norms and values that exist in students' social environments will influence students to have good or bad morals.

2.2 Disaster Preparedness

2.2.1 Definition of Disaster Preparedness

Preparedness is defined by the United Nations International Strategy for Disaster Reduction (UNISDR) (2015) as knowledge, capabilities, and actions of governments, organizations, community groups, and individuals "to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions." Disaster preparedness is critical in mitigating the adverse health effects of natural disasters (Emily Y.Y. Chan, 2018).

Preparedness is a series of activities to anticipate disasters through organizing and appropriate and efficient steps (Yanuarto, 2019).

Several efforts can be made to increase student knowledge and skills in disaster preparedness by holding school training and displaying disaster preparedness simulation materials using media.

2.2.2 Factors Affecting Disaster Preparedness

Several factors affect preparedness, according to (LIPI-UNESCO/ISDR, 2006) consisting of:

1. Knowledge and Skills Towards Disaster Risk

   Knowledge is the main factor and is the key to preparedness. The knowledge can influence the attitude and concern of the community to

be ready and alert in anticipating disasters, especially for those who live in coastal areas vulnerable to natural disasters.

2. Policies and Guidelines

   Relating to preparedness for anticipating natural disasters. Natural disaster preparedness policies are very important and are concrete efforts to carry out disaster preparedness activities. Policies that significantly affect preparedness include public education, emergency planning, disaster warning systems, and resource mobilization, including funding, management organizations, human resources, and important facilities for disaster emergencies.

3. Plans for Natural Disaster Emergencies

   This plan is an important part of preparedness, especially concerning evacuation, aid, and rescue to minimize disaster victims. This effort is crucial, especially during a disaster and in the first days after a disaster before aid from the government and outsiders arrives.

4. Disaster Warning System

   This system includes warning signs and information distribution in the event of a disaster. With this disaster warning, people can take appropriate actions to reduce loss of life, property, and environmental damage.

5. Resource Mobilization

   Available resources, both human resources (HR) and funding and important infrastructure for emergencies, are potentials that can support

or otherwise become obstacles in natural disaster preparedness. Therefore, resource mobilization is a crucial factor.

2.2.3 Efforts to Increase Disaster Preparedness

Disaster preparedness provides the platform for efficient, practical, and organized preparation, eliminating duplication of resources and increasing the local inhabitants' overall effectiveness of response activities (Shah et al., 2020).

The National Agency for Disaster Countermeasure (BNPB) 2022 stated that preparedness efforts can be carried out by carrying out an action plan implemented in an activity aimed at reducing disaster risk to avoid casualties, loss of property, and changes in people's lives. Efforts to improve disaster preparedness can be in the form of (Yanuarto, 2019):

1. Understand the dangers around you.
2. Understand local early warning systems and know evacuation routes and evacuation plans.
3. Have the skills to evaluate situations quickly and take action initiatives to protect themselves.
4. Have a disaster preparedness plan for the family and put the plan into practice with exercises.
5. Reducing the impact of hazards through mitigation exercises.
6. Get involved by participating in training.

2.3 Knowledge and Skills Concepts

2.3.1 Definition of Knowledge

Knowledge results from learning in its full spectrum of aspects (Monteiro, 2017). According to (Kim et al., 2021), a hallmark of domain knowledge expertise in reading is the ability to build and leverage retrieval structures that support the mental instantiation of an elaborate situation model.

Educators assert that knowledge is enhanced when students are actively engaged in the learning process, and when this is coupled with guidance and scaffolding from the instructor, students can better understand science concepts (Şimşek & Kabapinar, 2019).

The construction of knowledge is an active process, not a passive process. Bruner argues that children construct their knowledge through three modes, they are: 1) enactive (actions, real words), 2) iconic (images and pictures), and 3) symbolic (words and symbols) (Zuliana et al., 2019).

That meaningful knowledge can assist in problem-solving and reflection, as the meaning of learning is formed by connecting the acquired knowledge with experience (Sun & Chen, 2016).

2.3.2 Knowledge Level

Knowledge has several levels in the cognitive domain. There are 6 levels (Anderson, 2019), namely:

1. Remember

Remembering is an attempt to retrieve knowledge or memory in memory that has been long or recently acquired. Remembering is important in a learning process that has meaning and problem-solving.

2. Understand

   Understanding can be interpreted as clarifying and comparing an already known object and correctly explaining an object again.

3. Application

   Application or application is the ability to use a material or technique previously studied in an actual condition.

4. Analysis

   Analysis is a person's ability to describe material that has been studied in an object into components that are still in one structure or related to the material that has been studied.

5. Evaluation

   Evaluation relates to a person's ability to check, assess, and criticize a material or object based on one's abilities that have been learned.

6. Create

   Creating is a cognitive process to create a new product or pattern different from before.

2.3.3 Definitions of Skills

Most studies of the socialization of achievement-related beliefs and academic skills in childhood and adolescence focus on the influence of teachers and parents, with fewer studies examining the potential role of peers (Gest et al., 2015).

The basic process skills in the program were determined as observing, comparing and classifying, inferring, predicting, defining operationally, measuring, recording and interpreting, formulating models, and constructing tables of data and graphs, while the integrated process skills were to be formulating hypotheses, identifying and controlling variables and experimenting (Ergül et al., 2011).

Skills knowledge measure, to assess whether the children learned the skills that were trained, each child viewed videotapes of male and female children of the same ages as the subjects, interacting with peers in various play and work situations. In each episode, a peer model faced a social problem (e.g., how to compliment another child, resolve a conflict over using the same work materials, etc.). The children were requested to (a) describe verbally what the peer model should do and (b) describe what he or she would do in a similar situation (la Greca & Santogrossi, 2019).

2.4 The Concept of an Earthquake Disaster Simulation Video Animation

2.4.1 Animated Video of Earthquake Simulation

1. **Definition of Animated Video**

Innovative information deployment strategies have the potential to help usher in a new era of educational tools that can be used to bring life-altering concepts into the realm of accessibility to the approximately one billion low-literate learners on the planet (Bello-Bravo & Baoua, 2012).

Animation constitutes a powerful pedagogical tool combining audio messages with tailored visual cues and graphics to explain complex concepts and engage student interest in learning (Liu & Elms, 2019).

According to the International Journal of Education and Development Using Information and Communication Technology (IJEDICT) (2017), mediated learning may contribute to widespread information, and public video screenings could lead to more behavioral or institutional changes than classical extension techniques do.

2. Benefits of Earthquake Disaster Simulation Animation Video

Learning media through animated videos has several benefits, including learning about disasters more effectively and efficiently for elementary school students (Bello-Bravo et al., 2017). Learning about disaster simulation through animated video media is expected to guide students in earthquake-prone areas to minimize casualties and material losses.

The benefits of using animated video media have a positive impact on learning, as follows:

a. Learning will be more interesting, generate learning motivation, provide stimulation, and activate student responses (Halkia & Grant Ludwig, 2022).
b. Learning becomes interactive by applying accepted learning theory and psychological principles of student participation, feedback, and reinforcement (Atesgoz & Sak, 2021).
c. Learning time can be shortened because most video media only require a short time to convey messages.
d. Positive attitudes of students towards what they learn and towards the learning process can be improved.
e. It can improve the quality of learning (Afridzal et al., 2018).
f. Animations are more engaging for children (Atesgoz & Sak, 2021).
g. Video media can present physically impossible events to present in class so that students can learn more about these events.
h. Make abstract concepts concrete. Concepts difficult to explain directly to students can be concretized using learning media in videos (Safitri et al., 2021).

3. Earthquake Disaster Simulation Video Procedure

The animated video entitled SIGEBU "SIaga GEmpa BUmi" discusses the definition of earthquakes, types of earthquakes, the consequences of earthquake disasters, and how to increase preparedness before, during, and after an earthquake for elementary school students.

Preparedness material is taken from the LIPI UNESCO (2006), and the preparedness training guide from BNPB (2017) (Membangun Kesadaran, Kewaspadaan dan Kesiapsiagaan dalam Menghadapi Bencana) book contains ways to increase earthquake preparedness including before an earthquake occurs to reduce the impact of disaster risk

1. Turn off power lines, water, and lights when not in use
2. Prepare a disaster preparedness bag (for emergency survival in the first 3x24 hours) and place it in a safe and easily accessible place

Contains personal and family identity documents such as family cards, important documents such as diplomas, land certificates, savings books, flashlights, whistles, snacks and drinks, and first aid kits. (in the form of a picture as a reference)

3. Pay attention to the location of the emergency door and stairs
4. Ways of escape, ensure safe evacuation routes and assembly points

When a disaster occurs, several things need to be considered. The concept of TALI (Tenang, Aman, Lapangan, Ikuti)

Tenang: Do not panic later. It can be dangerous for yourself and others

Aman: Immediately protect your head with existing objects, such as thick book bags, or with both hands by forming a safe triangle elbow. If you are in a high-rise school building, run out immediately, use the stairs, do not take the elevator. If it is not possible, immediately take cover under the table, away from mirrors, away from mirrors and hanging objects.

Lapangan: Towards the field or a safe gathering point, stay away from trees, buildings, electricity poles, and other objects that have the potential to collapse, pay attention to where we stand, and avoid cracks in the ground.

Ikuti: Follow directions from teachers and school officials

After an earthquake occurs:

1. Beware of aftershocks

2. Physical recovery, treat injuries, provide medical assistance, save lives, move to a safer place

2.5 The Effect of Earthquake Simulation Animation Videos on the Knowledge and Skills of Disaster Preparedness

The main concern for areas with an increased prevalence of earthquakes is the potential for earthquake damage, especially for structures built in areas with high earthquake hazards (Halkia & Grant Ludwig, 2022).

Learning disaster preparedness for children aged 7-12 years differs from learning for adults. The ages of these children fall into the elementary school age, grades one to six students. Adults may find it easier to understand material with just a few words, reading, listening, or conventional teaching systems. The animation approach also includes a clear and easy message that works on an individual's perceptions to adapt the technique shown in the video (Bello-Bravo et al., 2017).

Disaster preparedness focuses on preparedness and prevention, not just when a disaster has occurred (Widiastuti et al., 2022). In this phase, knowledge and skills are needed related to understanding that focuses on knowledge to survive as a survivor and to know the abilities possessed by each individual to deal with the disaster that will occur. Preparedness can minimize the negative impact of hazards through effective and appropriate preventive measures (LIPI-UNESCO/ISDR, 2006).

The researcher carried out the learning process in the control class using animated video media. It aimed to present an interesting atmosphere in the classroom. Animated videos are intended to replace direct disaster simulations in the field, but students can see information concretely and effectively (Mahmudah & Fauzia, 2022).

Using animated videos makes learning more efficient and helps students absorb the subject matter more deeply and completely (Afridzal et al., 2018).

2.6 Synthesize Table

Table 2.1 Synthesize Of The Effect Of Earthquake Simulation Animation Videos On The Knowledge And Skills Of Earthquake Disaster Preparedness In 5th Grade Elementary School Klatak Banyuwangi 2023

No.	Author	Study Design & Sample	Analysis Data	Variable and Measurement	Result	Conclusion
1.	Susi Mahmudah & Farah Fauzia, (2022) **Title:** Application of Simulation Models Of Earthquake Natural Disaster Mitigation Learning Based on Video Animation to Improve Student Learning Outcomes	1. Quantitative research with experimental type 2. N = 24 participants used stratified class sampling	Correlation analysis with the Product Of The Moment formula	Used animated videos and Multiple Choices Test Sheet Instrument disaster mitigation	1. Earthquake natural disaster mitigation learning before the application of video-animation-based simulation models in the high category amounted to 4 (16.67%), medium numbered 14 (58.33%) students and low category amounted to 6 (25%) students 2. Learning earthquake	After the data was obtained and then analyzed with a significance level of 5% and 1%, it was found to be smaller than ro 0.404 <0.661> 0.515. It could be concluded that there was a significant influence between the application of video-animation-based simulation

					natural disaster mitigation after the application of an animation-based video-based simulation model, there was an increase where the number of students in the high category was 8 students with a percentage (33.34%), and 11 students with a percentage (45.83%), and 5 students with a percentage	models in improving student learning outcomes at SD Negeri 3 Semende
2.	Aulia Afridzal, (2018) **Title:** Differences in Learning Outcomes Using Image Media and Animation Video on Description	1. Quantitative with true experimental pre-posttest design 2. All 60 students in class III at SD Negeri 28 Banda Aceh were grouped	Analyzed by statistical t-test	The experimental group was taught video animation, while the control group was taught image media.	1. For the experimental group obtained value − = 78,9, *S*1 2 = 193,75, and S1 = 13,92 2. For the experimental group obtained value 2 − = 63,23	It can be concluded that there are differences in learning outcomes using media images and animated videos in the description essay

	Materials in Class III SD Negeri 28 Banda Aceh	into an experimental class (class IIIA) and a control (class IIIB); the experimental group consisted of 30 students, and the control group consisted of 30 students used purposive sampling			, *S*2 2 = 162,13, and S2 = 12,73 3. Statistically, using the t-test at a significant level α = 0.05, dk = obtained t count = 4.82, and t table = 1.67 means that t count > t table is 4.82 > 1.67, so the alternative hypothesis (Ha) is accepted, and Ho is rejected.	material for class III SD Negeri 28 Banda Aceh.
3.	E W Winarni , E P Purwandari and W Wachidi, (2021) **Title:** The Effect of Android-Based Earthquake Game Toward Bengkulu City Elementary School Students' Knowledge about	1. The research used the Matching – Only Pre-test Post-test Control Group Design. 2. The result of sampling was Elementary State School number 58 Cluster A as a control group	Analyzed by statistical t-test	Android-based earthquake game and Multiple Choices Test Sheet Instrument	The result found that the android-based earthquake game group mean (M = 87.08, SD = 14.35) knowledge was higher than the control group mean (M = 79.46, SD = 11.88). Therefore, the null hypothesis was rejected, t (53) = 2.17, p < .05, which means that there was	The conclusion is that the android-based earthquake game has a good effect on student‘s knowledge about disaster preparedness

	Earthquake Disaster Preparedness	and Elementary State School number 74 Cluster A as an experiment group. There were 26 students in the control group, while 27 students in the experiment group were selected by random cluster sampling.			a significant difference between the experiment group and the control group	

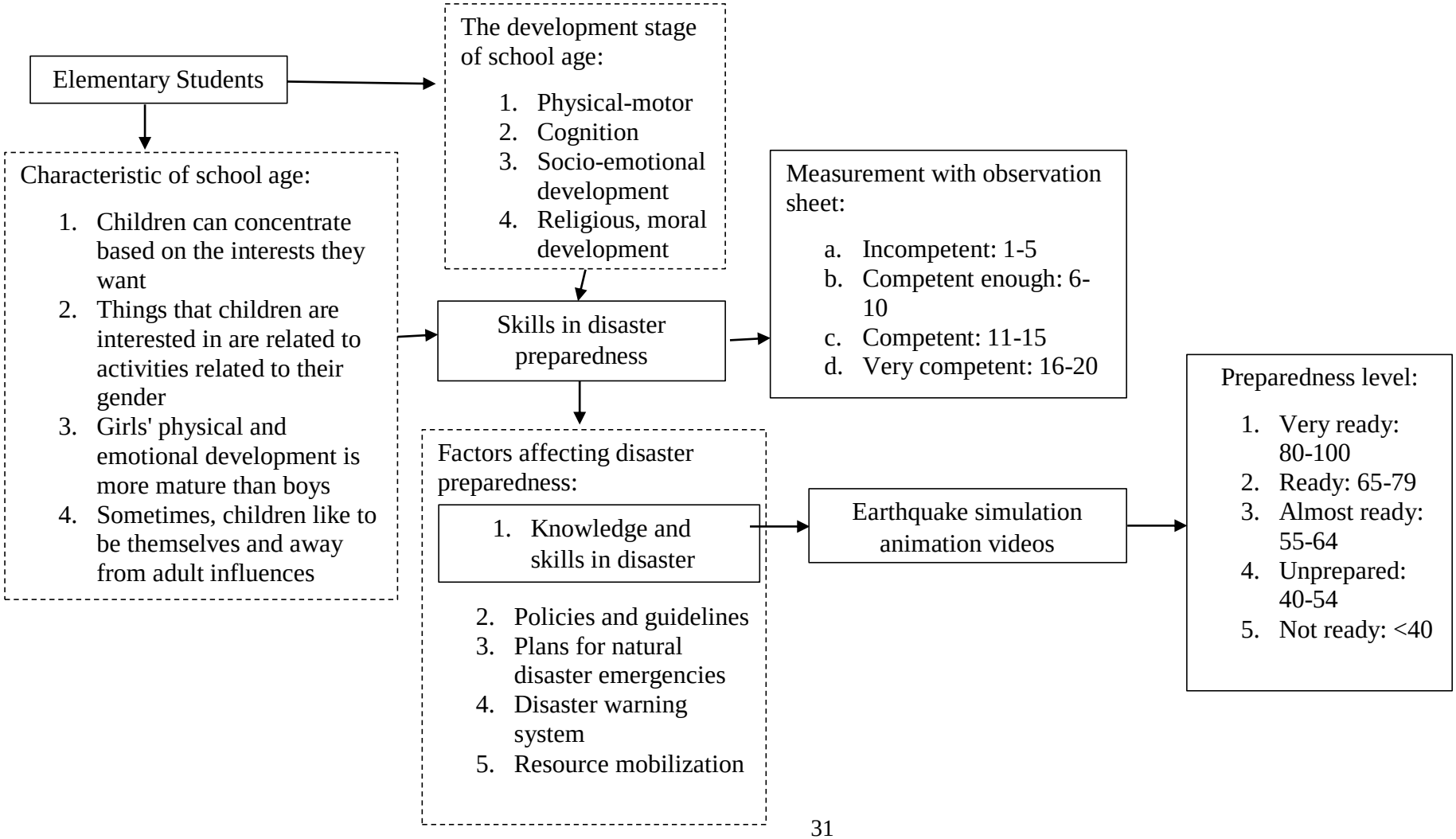
4.	Chelsea Liua and Philip Elms (2019) **Title:** Animating student engagement: The impacts of cartoon instructional videos on the learning experience	Using survey responses from 254 students from two cohorts	Analyzed by observation	Animation cartoon videos and Likert-scale questions	These results show that younger and older students benefit from animated videos for vastly different reasons. To younger students, making learning more interesting is an important aspect of interacting with animated videos	results showed that animated teaching videos could enhance students' learning experience through four specific avenues, including (1) increasing student interest and engagement in the learning process, (2) improving students' self-assessed understanding of the materials by simplifying the technical concepts, and providing visual aids, (3) facilitating flexible and self-paced learning and (4)

						providing a refreshing change from conventional teaching
5.	Desy Safitri, Ika Lestari, Arifin Maksum, Nurzengky Ibrahim, Arita Marini, (2021) **Title:** Web-Based Animation Video for Student Environmental Education at Elementary Schools	A design of quasi-experimental was applied in this research Used simple random sampling with the Slovin Formula sampling technique consisting of 137 students	A test for normality was carried out as a prerequisite for the analysis. The normality test in this study used the Kolmogorov-Smirnov test to determine whether the data distribution of experimental and control groups was normally distributed or not	The experimental group used animation videos based on the web, and the control group used the conventional method	This tool can keep students away from memorizing lessons but understanding them deeply	There is a positive effect of web-based animation video applications on environmental education for elementary school students

CHAPTER 3

CONCEPTUAL FRAMEWORK AND HYPOTHESIS

3.1 Conceptual Framework



Note:

——— = Variable studied

------ = Variable not studied

Figure 3.1 Conceptual Framework of The Effect Of Earthquake Simulation Animation Videos On The Knowledge And Skills Of Earthquake Disaster Preparedness In 5th Grade Elementary School Klatak Banyuwangi 2023

3.2 Hypothesis

The hypothesis is a conjecture or temporary answer to a question or research objective (Nursalam, 2020).

Hypotheses are arranged before the research is carried out because hypotheses can provide clues at the data collection, analysis, and interpretation stages.

This study hypothesizes that earthquake animation video has an effect on knowledge and skills of earthquake disaster preparedness for 5^{th}-grade elementary school Klatak Banyuwangi 2023.

CHAPTER 4

RESEARCH METHODS

4.1 Research Design

The research design will use a pre-experimental design with one group pre and post-test design. The experimental research method is a research method that is used to find a certain influence (treatment) (Daniel & Harland, 2017).

The researcher chose this type of research because the research design could compare conditions before and after being given treatment so that the treatment results could be known more accurately. Pretest-posttest designs are widely used in behavioral research to compare groups and/or measure change resulting from experimental treatments (Dimitrov & Rumrill, 2018).

Research design can be developed as follows:

Subject	Pre Test	Intervention	Post-test
S	01	X	02

Table 4.1 Research design pre and post-test

Note:

S : Subject

01 : Observation before intervention

X : Intervention (Simulation animation videos)

02 : Observation after intervention

4.2 Frame Work

According to Nursalam (2020), the framework is the stages or steps in science that are carried out in conducting research, from the initial to the final activities.

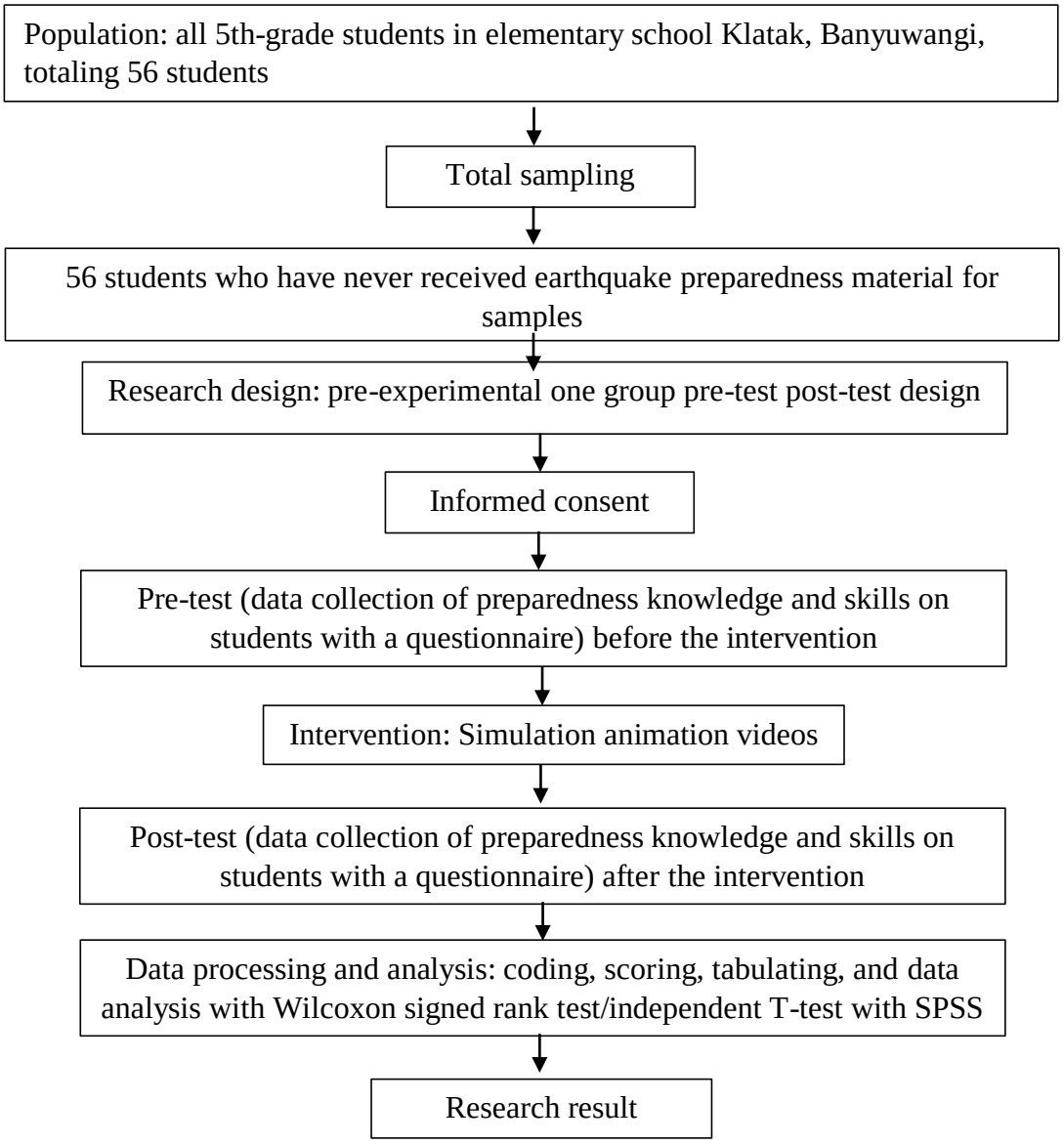


Figure 4.1 Framework of The Effect of Earthquake Animation Video on Knowledge and Skills of Earthquake Disaster Preparedness for 5th Grade Elementary School Klatak Banyuwangi 2023.

4.3 Population, Samples, and Sampling Technique

4.3.1 Population

The population is all members of a group of clearly defined people, events, or objects (Kerlinger, 2017). The population in the study are subjects (e.g., humans, patients) who meet predetermined criteria (Nursalam, 2020). The population in this study were 5th-grade students at the Elementary School Klatak Banyuwangi who had never received material on preparedness knowledge and skills, with a total of 56 students.

4.3.2 Samples

According to Nursalam (2020), the sample is an affordable part of the population that can be used as a research subject through a sampling technique. The sample in this study, 56 respondents, were 5th-grade students at Klatak Banyuwangi Elementary School who had never received material on preparedness knowledge and skills. The researcher determined the inclusion and exclusion criteria in this study, including:

1. Inclusion criteria

   Inclusion criteria are the general characteristics of research subjects from a target population that can be reached and will be studied. Scientific considerations should be guided when determining inclusion criteria (Nursalam, 2020). In this research, the inclusion criteria are that all 5th-grade elementary school students at Klatak Elementary School had never received material on disaster preparedness.

2. Exclusion criteria

Exclusion criteria are excluding/removing subjects who meet the inclusion criteria from research for various reasons (Nursalam, 2020). In this research, the exclusion criteria are students unwilling to be respondents and students who did not attend school due to permission or illness.

4.3.3 Technique Sampling

Sampling techniques are the methods used in taking samples that fit the entire object of research (Nursalam, 2020). In this research, the sampling technique used is total sampling. Total sampling is a technique where the number of samples equals the population (Zamrodah, 2016). The reason for using total sampling is that because the total population is less than 100, the entire population is used as a sample of research (Kerlinger, 2017).

4.4 Identification Variable

Various variables include independent, dependent, moderator, confounding, and control variables (Nursalam, 2020). Variable types are classified into various types to explain the research. Variable in this research is:

1. **Independent Variable**

Variables that influence or their value determine other variables (Nursalam, 2020). In this research, the independent variable is an earthquake simulation animation video.

2. Dependent Variable

Is a variable that is affected by its value by other variables (Nursalam, 2020). The dependent variable in this research is knowledge and skills in earthquake disaster preparedness.

4.5 Operational Definition

An operational definition is how we (researchers) decide to measure the variables in our research (Science Education, 2018).

Table 4.2 Operational Definition The Effect of Earthquake Animation Video on Knowledge and Skills of Earthquake Disaster Preparedness for 5th Grade Elementary School Klatak Banyuwangi 2023.

No.	Variable	Operational Definition	Indicator	Measurement	Scale	Score
1.	Independent variable animated video of an earthquake disaster simulation	Animated video is a media collection of moving images that can increase children's interest and motivation in learning	a. Definition of earthquakes b. Types of earthquakes c. The consequences and how to increase preparedness before, during, and after earthquake	An animated video of an earthquake disaster simulation with a duration of 04.33 minutes is shown twice in each session.	-	-
2.	Dependent variable a. Knowledge of disaster preparedness b. Skills of disaster preparedness	a. Disaster preparedness knowledge, namely efforts that can be carried out to anticipate disasters through organization and appropriate and efficient steps b. Disaster preparedness skills,	1. Knowledge and skills towards disaster risk 2. Policies and guidelines 3. Plans for natural disaster emergencies 4. Disaster warning system 5. Resource mobilization	a. LIPI UNESCO disaster preparedness questionnaire b. Observation sheet	a. Ordinal b. Ratio	1. Very ready: 80-100 2. Ready: 65-79 3. Almost ready: 55-64 4. Unprepared: 40-54 5. Not ready: <40 1. 1-5 Incompetent

		namely efforts that can be increased anticipate disaster through organization and through appropriate and efficient steps				2. 6-10 Competent enough 3. 11-15 Competent 4. 16-20 Very competent

4.6 Data Collection and Data Analysis

Data collection is approaching the subject and collecting the characteristics needed in research (Nursalam, 2020).

4.6.1 Research Instrument

According to Nursalam (2020), a research instrument is a tool used to obtain information from respondents regarding reports about their personalities or things they want to know. The instrument used in this research is the independent variable using a simulation animation video, while the dependent variable uses the LIPI UNESCO disaster preparedness questionnaire.

1. Demographic data questionnaire

   Demographic data is information about a group of people according to certain attributes such as age, gender, and place of residence and can include socioeconomic factors such as occupation, family status or income.

2. LIPI UNESCO disaster preparedness questionnaire.

This research questionnaire uses a checklist. As for the questionnaire regarding knowledge, skills and actions on earthquake disaster preparedness, the questions contained the concept of disaster, types of disaster, disaster preparedness, ways of self-rescue, and experience of disaster preparedness activities at school, as well as techniques for helping them, score measurement in the form of:

a. Very ready: 80-100
b. Ready: 65-79
c. Almost ready: 55-64
d. Unprepared: 40-54
e. Not ready: <40

3. Observation sheet of skill

Contains an assessment to assess skills regarding disaster preparedness in students. The researcher fills in the observation sheet. Score measurement in the form of:

a. Incompetent: 1-5
b. Competent enough: 6-10
c. Competent: 11-15
d. Very competent: 16-20

4. Animation video

The researcher shows an animated video about earthquake preparedness in the form of moving and simple images that are easy for elementary school students to understand. The animated video entitled SIGEBU "SIaga GEmpa BUmi" with a duration of

approximately 04.33 minutes, discusses the definition of earthquakes, types of earthquakes, the consequences of earthquake disasters and how to increase preparedness before, during a disaster, and after an earthquake for elementary school students.

4.6.2 Research Location and Time

1. Location or place of research

   The research was conducted at Klatak Banyuwangi Elementary School

2. Time

   The research will be carried out from August 2023

4.6.3 Data Collection

The researcher submitted a preliminary study letter to the place of research at the Banyuwangi Klatak Elementary School. After obtaining approval, researchers collected data using observation and questionnaires.

The procedure for collecting research data was carried out in steps as follows:

a. Explain the purpose, benefits, and data collection procedures for prospective respondents.
b. Ask prospective respondents' consent not to tell the contents of the "SIGEBU" animated video to other people/friends who have no education provided through animated videos.
c. Provide informed consent to prospective respondents and fill out a questionnaire.

d. Fill out questionnaires and observation sheets about knowledge and skills in earthquake preparedness at the beginning of the meeting before giving intervention. Distribute observation sheets by forming small groups and identifying disaster preparedness simulation skills according to the materials in the animated video.
e. Explaining the overall research activity contract schedule to the respondent.
f. Providing education through animated videos to respondents.
g. Ask for the willingness and motivation of respondents to pay attention and listen to education properly.
h. Fill in the post-intervention observation questionnaire sheet at the end of the intervention.

4.6.4 Data Analysis

After collecting the data, the researcher edited, coded, scored, tabulated, and analysed statistically.

1. Editing

   Editing is an attempt to re-check the correctness of the collected data. Editing can be done at the data collection stage or after the data has been collected (Notoatmodjo, 2010). In this research, the editing process will be done on general observation data.

2. Coding

   Coding is giving code to data and aims to translate data into codes, usually in numbers (Notoatmodjo, 2010).

   a. Variable simulation animation video

a. Yes : 1

b. No : 2

3. Scoring

Scoring is determined using the following formula:

$$indeks = \frac{sum\ of\ parameter\ real\ score}{-parameter\ maximum\ score}\ 100$$

1. Variable knowledge of disaster preparedness

a. Very ready: 80-100

b. Ready: 65-79

c. Almost ready: 55-64

d. Unprepared: 40-54

e. Not ready: <40

2. Variable skills of disaster preparedness

a. Incompetent: 1-5

b. Competent enough: 6-10

c. Competent: 11-15

d. Very competent: 16-20

4. Tabulating

Tabulation is the presentation of data in tabular form consisting of several lines and columns. Tables can simultaneously present several variables resulting from observations, surveys or research so that the data is easily read and understood (Notoatmodjo, 2010).

a. Statistical Analysis

1. Univariate analysis

All analyses will be performed using SPSS 16 for Windows. Mean, standard deviation, range, percentage, and frequency will be used to describe demographic data (age, gender, place of residence, and can include socioeconomic factors such as occupation, family status or income).

2. Bivariate analysis

The analysis used to determine the effect of two variables, to determine the effect of the two variables is carried out by statistical tests.

The statistical test by the researcher will use Wilcoxon signed ranks using SPSS 16 for Windows. The aim is to test the comparative hypothesis of two samples correlated with ordinal data scales (Nursalam, 2020).

Table 4.3 Statistical Analysis of the effect of earthquake animation video on knowledge and skills of earthquake disaster preparedness for 5th-grade elementary school Klatak Banyuwangi 2023.

No.	Aim	Variable	Measurement Scale	Statistic Approach
1.	Identification of demographic data variables	Animated video of earthquake disaster simulation 1. Know about the earthquake disaster simulation animation video	Ordinal Ratio Nominal Ordinal Ordinal Ordinal	Statistical descriptive

		2. Age 3. Gender 4. Place of residence 5. Socioeconomic 6. Family status or income		
2.	The Effect of Earthquake Simulation Animation Videos on the Knowledge and Skills of Disaster Preparedness	1. Data on the level of influence of earthquake disaster simulation animation videos with preparedness knowledge (UNESCO LIPI Questionnaire) 2. Data on the level of influence of an earthquake disaster animation simulation video with preparedness skills (observation sheet for skills)	Ordinal Ratio	Wilcoxon signed ranks

Testing rule:

1. If P <0.05, then H0 is rejected, which means that the earthquake disaster simulation animation video influences earthquake preparedness knowledge and skills in 5th-grade elementary school students in Klatak Banyuwangi.
2. If P >0.05, then H0 is accepted, which means that the earthquake disaster simulation animation video does not affect

the knowledge and preparedness skills of 5th-grade elementary school students in Klatak Banyuwangi.

4.6.5 Statistic Test

1. Normality test

   A normality test determines whether the sample studied is from a normal distribution population. This research used the SPSS application for normality testing. Generally, the normality test can use the manual method with the following formula:

   Formula:

$$x^2 = \sum \frac{(fo - fh)^2}{fh}$$

Interval	fo	fh	$(fo - fh)$	$(fo - fh)^2$	$\frac{(fo - fh)^2}{fh}$
TOTAL					

   In this research, the normal test used was the Kolmogorov-Smirnov test because the sample was more than 50. The data collected data was tested using SPSS 16 Software for Windows, with the following conclusion:

   a. Data is normally distributed if p-value > 0,05
   b. Data are not normally distributed if p-value < 0,05

2. Wilcoxon signed ranks

The Wilcoxon signed test is a non-parametric test used to measure the differences between 2 groups of paired data on an ordinal or interval scale, but the data is not normally distributed. This test is also known as the match pair test. The basis for decision-making in the Wilcoxon signed test is as follows:

- When the Asym. Sig 2 failed probability value < 0.05, then there is an average difference.
- When the probability value of Asym. Sig 2 failed > 0.05. There is no average difference

3. Kolmogorov smirnov test

This test is carried out by comparing the cumulative distribution of the empirical data distribution with the expected normal distribution. Because it is a differential test, the p-value is not significant (p>0.05), indicating that there is no difference between the two distributions (Widhiarso, 2022).

The basic concept of the Kolmogorov-Smirnov normality test is to compare the data distribution (which will be tested for normality) with the standard normal distribution (Quraisy, 2022).

a) If significance ≤ 0.05 means there is a significant difference, and if significance ≥ 0.05, then there is no significant difference.

b) The application of the Kolmogorov-Smirnov test is that if the significance is ≤ 0.05, the data to be tested has a significant difference from standard normal data, meaning that the data is not normal.

c) If the significance ≥ 0.05 means that there is no significant difference between the data to be tested and the standard normal data, it means that the data we are testing is normal.

4.7 Research Ethics

In conducting this research, the researcher needs to submit a title to the principal of the Banyuwangi Klatak Elementary School to obtain permission, starting from the preliminary study permit to collect initial data. After being approved, the researcher makes observations on the subject to be studied by emphasizing ethical issues by the Health Research Ethics Committee No: 170/01/KEPK-STIKESBWI/VII/2023

1. Informed Consent

Informed consent is information that must be given to subjects in full about the purpose of the research to be carried out. It has the right to freely participate or refuse to become a participant (Nursalam, 2020).

a. Before conducting the research, permission was obtained from participants.

b. If the participants were willing to be the research subject, the research there must be proof of agreement, with a signature.

c. The researcher must not be forced if the participant is unwilling to be the research subject.

2. Anonymity

Subjects do not need to put their names on the data collection sheet. Just write the number or code to guarantee the confidentiality of their identity. If the researcher demands to know the subject's identity, the researcher must obtain prior approval and take steps to maintain confidentiality and protect the answer (Daniel & Harland, 2017).

3. Confidentiality

Confidentiality is an ethical issue in a study by assuring the confidentiality of research results, information, and other issues. All information that has been collected is guaranteed confidentiality by the researcher. Only certain data groups will be reported on the result of the research (Nursalam, 2020).

4. Non-Maleficence

Non-maleficence is not causing harm or physical and psychological injury to participants. The principle of non-maleficence means that the researcher must always aim to help participants overcome their problems in providing interventions (Zamrodah, 2016).

5. Justice

The researcher conducts research without having to see who a colleague is to obtain the same portion of opinion and provide input to the research conducted (Dimitrov & Rumrill, 2018).

4.8 Research Limitations

The research that had been done following the thesis had been done, but there were still some limitations in terms of sampling and the implementation of data collection.

1. Sampling Technique

   The determination of the sample in this study is different from the proposals made, where the sample numbered 66 students. When the research took place, only 56 students were found to be able to take part in the research. Because of the time, the researchers did many independence competitions.

2. Time of data collection

   When the research was carried out in August, many events were carried out at the research location, causing it to be less conducive.