

## NATURAL DISASTER AND MITIGATION ENCYCLOPEDIA BOOK BASED ON ISLAMIC VALUES FOR ELEMENTARY STUDENTS

**Kirana Prama Dewi<sup>1</sup>, Nabila Ulfah<sup>2</sup>**

<sup>1,2</sup>Department of Elementary Teacher Education, Universitas Ahmad Dahlan

**Abstract:** *This research aims to determine feasibility for the natural disaster and its mitigation based on Islamic Values for elementary school students. This study uses the research and development (R&D) method, the model used in the research is the ADDIE model. This stage of development is analyze, design, development, implementation, and evaluation. The subject of the research trials is 36 students of grade IV and V SD Muhammadiyah Pakel Program Plus Yogyakarta. Data collection techniques are interviews, observations, and the teacher and student response assessment sheets are then analyzed using quantitative and qualitative data. Media Feasibility Assessment results by media experts acquiring a score of 4, material expert 3.9, learning expert 3.88, and linguist 3.50. Besides, a small-scale student response with a score of 97.5 and a large-scale student response with a score of 97.8. Based on some assessments, the average value of 95.1 was achieved with the "excellent" category. Based on this assessment, the category "Very Feasible" was obtained. The response from the teacher obtained from an extensive questionnaire obtained good results starting from the presentation of the material, the layout, the colors used, as well as the pictures/illustrations presented. From these results, it can be concluded that the natural disaster and its mitigation based on the Islamic values encyclopedia are appropriate for learning.*

**Keyword:** *Natural Disaster, Mitigation, Encyclopedia Book, Islamic Values*

**Abstrak:** Penelitian ini bertujuan untuk mengetahui kelayakan ensiklopedia bencana alam dan mitigasinya berbasis nilai keislaman bagi peserta didik sekolah dasar. Penelitian ini termasuk jenis penelitian pengembangan, dengan menggunakan model pengembangan ADDIE. Tahapan pengembangan ini *analyze, design, development, implementation, dan evaluation*. Subjek uji coba penelitian adalah peserta didik kelas IV dan V SD Muhammadiyah Pakel Program Plus Yogyakarta yang berjumlah 36 orang. Teknik pengumpulan data menggunakan wawancara, observasi dan lembar penilaian respons guru dan peserta didik kemudian dianalisis menggunakan data kuantitatif dan kualitatif. Hasil penilaian kelayakan media oleh ahli media memperoleh nilai 4,00, ahli materi 3,86, ahli pembelajaran 3,88, dan ahli bahasa 3,50, respons peserta didik skala kecil 93,33, dan respons peserta didik skala besar dengan nilai 94,33. Berdasarkan dari penilaian tersebut didapatkan kategori "Sangat Layak". Respons dari guru diperoleh dari angket terbuka memperoleh hasil yang baik mulai dari penyajian materi, tata letak, warna yang digunakan, serta gambar/ilustrasi yang disajikan. Dari hasil tersebut dapat disimpulkan bahwa ensiklopedia gejala alam dan mitigasinya berbasis nilai keislaman layak digunakan dalam pembelajaran.

**Kata Kunci:** Bencana Alam, Mitigasi, Buku Ensiklopedia, Nilai Islam

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<sup>1</sup>Universitas Ahmad Dahlan, Email: [kirana.dewi@pgsd.uad.ac.id](mailto:kirana.dewi@pgsd.uad.ac.id)

<sup>2</sup>Universitas Ahmad Dahlan, Email: [nabila1600005115@webmail.uad.ac.id](mailto:nabila1600005115@webmail.uad.ac.id)

## INTRODUCTION

Indonesia is very well known as a country prone to natural disasters. This natural disaster occurs when the appearance of natural phenomena that cause much damage even to death (Pahlawaniati, 2013, pg.3). That is because of Indonesia's geographical condition with the predicate of the state of fire belt or ring of fire. The Indo-Australian plate crosses the geographical condition of Indonesia in the south, Eurasia from the North and the Pacific from the east, with this position making Indonesia a country that has active volcanoes and a very high potential for natural disasters. Natural disasters that are very familiar with Indonesia are earthquakes, volcanic eruptions, tsunamis, floods, and landslides (Warsono, 2012).

According to the National Disaster Management Agency (BNPB), in 2019, 1,998 disasters were occurring from the beginning of 2019 to 31 August 2019. From these data, it was recorded that there were 445 deaths, 1,431 injured, 937,939 displaced. Other impacts also affected damage to community buildings where 3,666 were heavily damaged, 4,178 were moderately damaged, 16,844 were lightly damaged, submerged 150,960, and damage to facilities was 788 units. Based on the National Disaster Management Agency (BNPB) 2019, one of the regions in Indonesia that is most frequently affected by natural disasters is the island of Java. There have been 991 natural disasters that have befallen the islands of Java, including the areas of DKI Jakarta, Central Java, DI Yogyakarta, and East Java. Based on these data, there are still many problems that arise from natural disasters in Indonesia including the low performance of disaster management, lack of attention about disaster mitigation, and the still low role of schools regarding the introduction of disaster mitigation education in schools (Astuti & Sudaryono, 2010).

Natural disaster mitigation efforts in Indonesia can be intensified through training and disaster simulation. Disaster

training and simulation can be successful if the community has a responsive response in the face of a disaster. One of the countries in Asia, namely Japan, has a scope of education in disaster education by integrating into the national curriculum. From an early age, the Japanese government hopes to understand personal safety in the face of disasters—likewise, the neighboring country, the Philippines (Indonesian Student Association, 2017). The Indonesian government continues to strive for disaster risk reduction education in order to realize the success of disaster mitigation in this country.

At the level of education in schools, disaster mitigation materials are also provided to improve disaster preparedness. The materials for disaster mitigation include education or curriculum regarding disasters and the existence of continuous simulations. Currently, the program has been implemented in several schools, namely the Disaster Preparedness School. Disaster mitigation education implemented in schools can build a community environment that responds to disasters around it (Suharwato, 2015, pg. 9).

As many as 250,000 schools in Indonesia are located in disaster-prone locations or 75% of all schools in Indonesia (Kompas.com, 2019). Of all the regions in Indonesia that are disaster-prone, including the Special Region of Yogyakarta (DIY). So that the education system policy should integrate disaster risk reduction education into all levels of schools in the Special Region of Yogyakarta (DIY), in line with DIY Regional Regulation Number 13, the Year 2015 states that education units are required to initiate an integrated disaster risk reduction into the education curriculum or other activities that are coordinated with related agencies. One of the schools in the Special Region of Yogyakarta (DIY) is the Muhammadiyah Elementary School Pakel Plus Program Yogyakarta.

Based on the results of interviews and preliminary observations, in terms of cognitive competence, teachers at the Muhammadiyah Pakel Elementary Program Plus Yogyakarta have delivered disaster material following the 2013 curriculum material on thematic learning related to natural disasters. From the results of the interview on August 25, 2019, Mr. Eka obtained the fact that from class I to class VI, there are natural disaster material and its mitigation on thematic learning. One example is the thematic learning on the theme of Natural Events in class I that has presented material on natural phenomena such as floods, tornadoes, and landslides. Other examples in the upper class can also be integrated into the thematic learning classes IV, V, and VI with the same Basic Competence, namely 3.1, in the content of Social Sciences lessons following the Ministry of Education and Culture Regulation (Permendikbud) Number 37 Year 2018.

On the other hand, schools also provide learning resources for natural disasters based on Islamic values. As for the teaching material that is integrated with Islamic values, the Muslim Kids Encyclopedia "Our Earth Series," there are natural disasters based on Islamic values that have not yet been equipped with mitigation of each natural phenomenon. Things that encourage the development of Islamic value-based teaching materials include Islamic-based schools, but in the learning process such as natural phenomena, there is still little to do with Islamic values. One factor is due to the unavailability of teaching materials that support these problems. In learning activities, especially natural phenomena and mitigation materials, the teacher has conveyed well about the material. However, there is no integration of Islamic values, which states that natural phenomena are very carefully related to Islamic values.

Based on the preliminary research results, it is necessary to develop learning resources for natural disasters and its mitigation based on Islamic values. One of the teaching materials that are of interest to students is the encyclopedia. From observations made on 12 to 15 August 2019 known facts, students are very interested in reading encyclopedias that present exciting pictures. The librarian also stated that students prefer reading material that contains a lot of illustrations and drawings, one of which is the encyclopedia.

The development of a natural disaster encyclopedia and its mitigation based on Islamic values is critical, considering that Muhammadiyah Elementary School Pakel Plus Yogyakarta is a Muhammadiyah Foundation school based on Islam. Islamic-based schools certainly have their characteristics, one of which is by integrating Islamic values in their implementation. This integration can enhance the spiritual aspects as a spirit in learning that can benefit those who learn it (Indriani, 2019, pg. 25). Natural disasters are closely related to Islamic values, moreover that this nature is a creation of Allah SWT. The life guide of Muslims is the Qur'an. In the Qur'an, there are many verses relating to disasters, for example, hurricane events that caused flash floods on the people of Noah, earthquakes, and hot clouds during the time of the Prophet Syu'aib, and so forth.

Science and religion are fundamental to be integrated because they have relations that are dynamic enough to be integrated. Integration, in this case, does not mean confusing, more specifically, interconnection integration. According to Amin Abdullah, one form of the relationship between religion and general science is the integration of interconnection (Indriani, 2019, pg. 25). Then, from Ian Barbour's view that science and religion have four forms of relations, including integration. Integration in terms of the concepts of religion and science

goes hand in hand, and science is given religious values (Andriyaldi, 2016, pg. 52). Besides, both of them are knowledge that is sourced from God, namely the science of verse Qauliyah (Qur'an) and Kauniyah science (the universe).

From some of these problems, the right solution is needed to create active learning. This research intends to develop alternative learning resources in the form of new and relevant teaching materials. One interesting teaching material for elementary school students is the encyclopedia. Where the encyclopedia as teaching material is uniquely designed and presents the material in a concise but comprehensive form also uses language that is easy to understand for its readers. The encyclopedia that will be developed contains information that contains science in a sophisticated and general and accurate way. Merriam-Webster dictionary (2020) states that the encyclopedia is a work that contains information on all branches of knowledge or treats a particular branch of knowledge comprehensively usually in articles arranged alphabetically often by subject

The use of encyclopedias can make it easier for students to learn natural disaster material and its mitigation based on Islamic values. Therefore, this is what underlies the theme of the study entitled Development of Natural Disaster Encyclopedia and Mitigation Based on Islamic Values for Elementary School Students.

The formulation of the problem in this study is how the feasibility of the natural hazard encyclopedia and its Islamic value-based mitigation for elementary school students? The purpose of this study is to determine the feasibility of a natural disaster encyclopedia and its Islamic value-based mitigation for elementary school students.

## METHOD

This research includes development research (R&D) using the

ADDIE model. The experimental subjects in this study were students in grades IV and V at Muhammadiyah Elementary School Pakel Plus Program Yogyakarta. Data collection techniques using questionnaires there are media experts, material experts, learning experts, language experts, and student responses and teacher responses. In this study, it was only carried out on a trial run and did not arrive at a large scale trial. Data analysis techniques in this study used qualitative and quantitative methods.

## RESULT & DISCUSSION

This research produced a book on Islamic values based on Islamic values for elementary school students. This encyclopedia book can be used as a supplement for thematic learning teaching materials on themes related to natural phenomena. The encyclopedia has passed the expert assessment stage and has been tested. Here are the final products of Islamic value-based encyclopedia books.

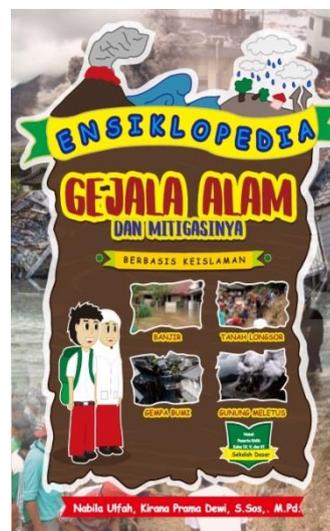


Figure 1. Cover Page Views

The process of developing a natural value-based Islamic disaster encyclopedia through five stages, namely first, Analysis in the form of curriculum analysis and analysis of student needs. Second, the design includes designing an encyclopedia framework, preparing material and illustrated images, designing encyclopedia

designs, and compiling encyclopedias appropriate to students' characteristics. Third, the development stage includes the stage of product development and validation by media experts, material experts, learning experts, and linguists. Fourth, the implementation phase is in the form of encyclopedias in small groups and trials in large groups. At this stage, the teacher evaluates and responds students after using the encyclopedia in learning. Fifth, the evaluation stage is the final stage of product development. The evaluation phase is carried out by analyzing the results of the validation of the experts, then the product improvements are developed following the criticisms and suggestions given.

The results of the assessment by experts of the natural disaster encyclopedia and mitigation based on Islamic values are as follows.

### Media Expert

The assessment of media experts was carried out by one expert in the field of learning media. The assessment includes the completeness of the book, graphic, typography, and unusual books (visual communication). The results of the assessment by media experts can be seen in the following Table 1.

**Table 1.** Recapitulation of media expert judgment

Assessment Aspects	Score
Completeness the book	4
Graphic	4
Typography	4
Visual Communication	4
Mean Score	4
Category	Very Feasible

In addition to providing an assessment, media experts also provide suggestions and comments, that is to add the encyclopedia's target user.

### Material Expert

The material expert assessment was carried out by two lecturers: social studies material experts and disaster

experts. The aspects assessed by material experts are the scope of the material, natural disaster material and its mitigation, as well as Islamic values. The results of the assessment of material experts can be seen in Table 2.

**Table 2.** Recapitulation of material expert judgment

Assessment Aspects	Score		
	Lecturer 1	Lecturer 2	Mean Score
Scope of the Material	3.7	4	3.85
Natural Hazard material & mitigation	4	3.7	3.85
Islamic Value	4	4	4
Mean Score	3.9	3.9	3.9
Category	Very Feasible	Very Feasible	Very Feasible

In addition to providing an assessment of the encyclopedia material, material experts also provide advice and comments. As for expert material suggestions and comments, among others:

- Paragraph 1 between statements and examples are out of sync (preface);
- Paragraph 3 "With this book ..." made into new paragraphs (preface);
- Essential Competencies and Indicators, Class IV and V KD 4.1 (the indicator section is adjusted to the Taxonomy Bloom or Anderson Operational Verbs list for the psychomotor domain);
- The addition of degree components in the learning objectives section.

### Learning Expert

The learning expert was carried out by one lecturer who expert in the field of learning in elementary schools. The assessment includes Conformity with learning objectives, Learning Activities, Conformity with the development of students, the suitability of the material being taught, and Encyclopedia as a teaching material supplement. The result of the assessment by learning expert can be seen in the following Table 3.

**Table 3.** Recapitulation of learning expert judgment

Assessment Aspects	Score
Conformity with learning objectives	3.6
Learning Activities	3.8
Conformity with the development of students	4
The suitability of the material being taught	4
Encyclopedia as a teaching material supplement	4
Mean Score	3.88
Category	Very Feasible

The critics, suggestions, and responses of learning experts to the encyclopedia book is an encyclopedia product that is good and feasible of use in learning, and it is advisable to add feedback for students in the lesson plan.

### Linguist Expert

Assessment of linguist expert was carried out by one expert in the linguist. The aspects assessed by linguists are linguistic. The results of the assessment of linguist experts can be seen in Table 4.

**Table 4.** Recapitulation of linguist expert judgment

Assessment Aspects	Score
Linguistic Aspect	3.5
Category	Very Feasible

The criticisms, suggestions, and responses from linguists towards the encyclopedia book, first, the encyclopedia product has been good, but it needs to be improved by the use of the term. Second, check the word writing and use capital letters or not. Third, consistency in using words and correcting sentences.

Suggestions and comments provided by media experts are useful for the revision process in the encyclopedia. The revision process is essential so that the resulting product reaches a predetermined level of eligibility.

The assessment of encyclopedia books is not only done by experts, but also by teachers. Teacher assessment uses open questionnaires on the aspects of the

suitability of the encyclopedia with learning material, Islamic values, disaster mitigation, and the suitability of the encyclopedia material to elementary school students.

Teacher response data were obtained from open questionnaires given to teachers. The teacher observes and evaluates the developed encyclopedia. The teacher's assessment to the material presented states that the material presented is following the material in the thematic (some Basic Competencies). The material in the encyclopedia book can support the achievement of learning and giving students a firm understanding. The teacher gives a positive response to the integration of Islamic values in natural disaster material and its mitigation. Islamic values in encyclopedia books are very supportive of learning outcomes.

The teacher also conveys the critics and suggestions. The criticisms and suggestions conveyed are that page 24 of the water cycle between the image and the caption is different. Overall, the encyclopedia is good enough based on filling in the value of an open questionnaire conducted by teachers at the Muhammadiyah Elementary School Plus Program. The teacher's response also mentioned that this encyclopedia is excellent if implemented in Muhammadiyah schools to provide new education for students who do not know the natural hazard in terms of the AlQuran because, in schools, they still deliver natural disaster according to the textbook reference.

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The results of this study are under the opinion of Majid (2014, pg. 89), which states that the encyclopedia can be made based on thematic learning principles in elementary schools. One of the thematic learning principles is that the material is interrelated and refers to the learning objectives. Besides, Alim (2011, pg. 24) states that Islamic values consist of the values of faith, worship values, and moral values that can be closer to Allah SWT in human life.

Learners also respond to encyclopedias. Students' responses are carried out after the implementation phase. The results of the students' responses are as follows.

### Assessment of Small Group Students

The results of responses in small groups were carried out on six students who were randomly selected. Student responses include attractiveness, quality of presentation of the encyclopedia, quality of the display, and understanding of Islamic values. The results of the response of small group students as follows.

**Table 5.** Recapitulation of small group Student Response

Assessment Aspects	Total Score	Score
Attractiveness	575	93.3
Quality of Presentation	580	96.7
Quality of the display	600	100
Understanding of Islamic Values	600	100
Mean Score		97.5
Category		Very Feasible

### Assessment of Large Group Students

The results of responses in large groups were carried out on 30 students who were randomly selected. The results of the

response of large group students as follows.

**Table 6.** Recapitulation of large group Student Response

Assessment Aspects	Total Score	Score
Attractiveness	2950	98.3
Quality of Presentation	2860	95.3
Quality of the display	2925	97.5
Understanding of Islamic Values	3000	100
Mean score		97.8
Category		Very Feasible

The implementation phase is carried out by taking data from natural disaster encyclopedia book assessment and Islamic value-based mitigation at the time of learning. Steps in learning by implementing an encyclopedia book as a supplement to teaching materials. The results of implementing the encyclopedia when learning is obtained from the responses of students and teachers. Student response data states that students are very interested in the encyclopedia because it was easy to understand and present new knowledge about natural phenomena and their relation to Islamic values. It also includes fascinating pictures and can also find exciting videos through QR codes. The teacher's response to the material presented states that the material presented is following the material, and the encyclopedia presented has included the AlQuran verse. Its application is following its Islamic basis; there is also a way of managing the environment. Furthermore, the teacher states that the encyclopedia material can support as one of coping with disaster. Then, the teacher states that this Islamic-based encyclopedia contains Islamic values and can be used as an effort to disaster risk reduction.

### CONCLUSION

The book on natural disaster encyclopedia and its mitigation based on Islamic values are appropriate to

supplement teaching materials for students in grades 4 and 5 of the Muhammadiyah Pakel Plus Program in Yogyakarta. Based on the results of the assessment by experts obtained an average overall score of 3.8 with the category "Very Eligible." At the implementation stage, product trials are conducted on students. This stage is carried out on the student participants twice, namely small-scale product trials and large-scale product trials. The small scale product trial obtained an average score of 97.5 in the very feasible category. Large-scale product trials obtained a score of 97.8 with a very decent category. In the implementation of learning, the teacher gives a positive response and states that the encyclopedia can be used to supplement natural disaster teaching materials and its mitigation. Besides, the encyclopedia makes it easier for teachers to integrate Islamic values into learning. Implementation of learning using the encyclopedia book following the stages of integration interconnection. The results of this study are in line with the opinion of Hidayat (2014) Integration-interconnection is an effort to bring together the sciences or social sciences into the religious sciences. This approach arises because of the dichotomy of knowledge from various disciplines. The integration and interconnection approach is an approach that seeks to respect each other between public and religious knowledge, is aware of each other's limitations in solving human problems, and will give birth to a collaboration, at least understanding the approaches and methods of thinking (process and procedure) between the two sciences.

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