KOASE: Disaster Mitigation Learning Media in Elementary School (Study of Design and Development)

by Eddy Noviana

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Abstract: Disaster mitigation learning in elementary schools in the knowledge that must be taught considering that Indonesia is a region that is vulnerable to disasters, for this purpose this research aims to design and develop KOASE comics that are appropriate to be used to understand and understand disaster mitigation. The research method used uses the 4D model with four stages: define stage, design stage, develop stage and disseminate stage. The results of the study obtained information on the feasibility of the product design stage which was assessed by an expert validator (expert appraisal) was 51.13 with a fairly decent category in the design of draft 1 increased to 90.97 with a very feasible category in draft 2. Teacher and student response data on the development stage obtained a score of 92.08 with a very good category for the score of teacher responses and a score for student responses obtained a score of 85.87 with a very good category. Then it can be concluded that the development of KOASE comics is appropriate to be used as a medium for disaster mitigation learning.

INTRODUCTION

Indonesia is a region that is in two forms causing natural disasters, namely natural disasters caused by geological and hydro-meteorological disasters. Geological natural disasters are natural disasters that are affected by shifts in the earth's plates. The earth plate in the territory of Indonesia consists of the Eurasian plate, the Pacific Plate and the Indian-Australian plate. The existence of these three plates is a factor that causes natural geological disasters. Geological natural disasters that are possible to occur from the presence of these plates in the territory of Indonesia are earthquake, tsunami and volcanic eruption.

In addition to natural disasters caused by the influence of the earth's plates, Indonesian territory is also affected by meteorological phenomena, this makes the Indonesian region will have an impact on natural disasters. The intended natural disaster is a hydrometeorological natural disaster. Hydro-meteorological natural disasters that are possible to occur are floods, landslides, tornadoes, drought and forest, and land fires.

Due to the region of Indonesia which is vulnerable to natural disasters, knowledge content about the disaster is needed. The disaster knowledge content must be able to provide in-depth information to be given to anyone in the face of natural disasters that will occur at any time. Disaster knowledge content is called disaster mitigation. Disaster mitigation is conceptual that was

developed to provide knowledge in early prevention in dealing with natural disasters, both before, during and after natural disasters with the main objective being to reduce and minimize the risks and impacts of a disaster that is happening. Therefore, conceptual disaster mitigation is a necessity that needs to be disseminated to the general public to provide knowledge content about the disaster.

Schools are one of the institutions that have legality in providing and stimulating knowledge about the disaster. Disaster mitigation education should be an important and major issue that must be done by schools considering that Indonesia is a region that is vulnerable to disasters. Elementary school is an education level that provides an initial foundation in shaping knowledge, attitudes, and skills. The formation of this initial foundation required planning and action tailored to aspects of ability at the level of elementary school students (UNESCO-IIEP, 2011). Students in elementary schools are individuals at the operational stage of the congress (Cherry, 2019) who make it possible to have a logical understanding and have awareness in taking action. Therefore, we need activities that stimulate this ability. One thing that can be done by schools is to provide a broad space for teachers to innovate in the learning process. Innovations made in learning are by developing learning media. Learning media is a component of learning resources that contain instructional material that can stimulate students to learn. The main function of learning media is as a teaching aid that also influences the conditions and learning environment that are arranged and created by the teacher. The use of instructional media in the orientation phase of learning achievement is very helpful in the effectiveness of the learning process and delivery of the contents of the learning message. The contents of the learning message as outlined in the learning media are the ability of students to understand disaster mitigation.

Comics are one of the learning media that can stimulate students to want to learn and learn things. Comics are learning media in the form of cartoons that have characters and characters. Comics are cartoon that express characters in the form of illustrated stories and are designed to provide entertainment and stimulation to students. Comic media in the form of cartoon characters are assumed to influence the ability of students in primary schools to understand disaster content so that students are expected to be able to maintain and protect the environment in the face of disasters (Toledo et al., 2014).

The comic developed was a disaster prepared comic named KOASE. KOASE is a comic that contains knowledge about activities that must be carried out before, during and after a disaster. It is expected that with this KOASE students can know and understand the activities or activities carried out as a disaster mitigation information literacy. This paper will describe the design process and development of a KOASE disaster prepared comic, so that it can be used as a learning medium by teachers, both in the learning process in the classroom or outside learning, so students are expected to be able to obtain information early on about disaster mitigation (Noviana, 2019).

METHOD

Design and development of KOASE disaster mitigation learning media using the development research method with the 4D model (Thiagarajan, 1974). This model consists of four stages, namely the define stage, design stage, develop stage and disseminate stage. In this study, not all stages were carried out, only limited to three stages. These stages can be seen in Figure 1 below.
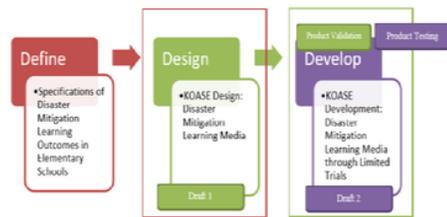
Figure 1. Stages of Research Implementation

The type of data used consists of qualitative data and quantitative data. Qualitative data in the form of comments and suggestions for improvement from expert validators obtained through the validation process and product trials. While quantitative data in the form of assessment scores provided by the validator, student and teacher responses to the use of KOASE: disaster mitigation learning media in elementary schools. The expert validator used to validate the product designed consists of expert appraisal and practitioners. The research subjects in the implementation of the product trial consisted of 12 teachers and 20 students. The aspects assessed by the validator at the develop stage consist of (a) content aspects; (b) presentation aspects; (c) design and color aspects; (d) linguistic aspects; and (e) content suitability aspects. For teacher response data after using KOASE: disaster mitigation learning media in elementary schools consist of: (a) aspects of content; (b) aspects of instructional media; (c) display aspects; (d) linguistic aspects. As for student response data consisting of: (a) aspects of content; (b) aspects of instructional media; (c) display aspects; and (d) aspects of interest.

Criteria used for the feasibility of KOASE design: learning media for disaster mitigation in elementary schools can be seen in Table 1 below:

Table 1. Eligibility Categories

No	Interval	Categories
1	$81 - 100$	very feasible
2	$61 - 80$	feasible
3	$41 - 60$	fairly decent
4	$21 - 40$	inadequate
5	$0 - 20$	not feasible

As for the responses of teachers and students used for the stages of the development of KOASE: media for disaster mitigation learning in elementary schools using the criteria as shown in Table 2 below:

Table 2. Teacher and Student Response Categories

No	Criteria	Interval
1	Very good	$81 - 100$
2	Good	$61 - 80$
3	Enough	$41 - 60$
4	Less	$21 - 40$
5	Very less	$0 - 20$

RESULT AND DISCUSSION
Define Stage

Before doing KOASE product design: disaster mitigation learning media in elementary schools, the thing to do is to analyze the needs related to the design of instructional media products. The activities carried out consist of (a) the front end analysis phase aims to bring up and determine the basis of the problems faced in learning, so that a design and development of a KOASE is needed: learning media for disaster mitigation in primary schools, from the results of the analysis at this stage information, is obtained that in the learning process about the concept of disaster mitigation teachers still use learning resources in the form of textbooks; (b) the learning resource analysis phase aims to find out the breadth and depth of the material about the concept of disaster mitigation needed students; (c) the student analysis phase aims to identify the characteristics of elementary school students on cognitive,

social and emotional aspects as well as background knowledge about disaster mitigation; (d) the concept analysis stage aims to identify, detail and arrange the main concepts systematically in the design and development of instructional media products; (e) the task analysis phase aims to identify the skills needed in the learning process related to the concept of disaster mitigation in accordance with the curriculum in elementary schools. From the analysis carried out previously, the design was obtained in the form of specifications for the achievement of disaster mitigation learning as shown in Figure 2 below.

Learning Outcomes

- Able to identify threats before, being and after: (a) geological and hydrometeorological disasters in Indonesia; (b) earthquake disaster; (c) tsunami disaster; (d) volcano disaster; (e) flood disaster; (f) landslides; (g) a tornado disaster; (h) drought; (i) forest and land fire disasters.

Learning objectives

- Students can explain the causes of (a) geological and hydrometeorological disasters in Indonesia; (b) earthquake disaster; (c) tsunami disaster; (d) volcano disaster; (e) flood disaster; (f) landslides; (g) a tornado disaster; (h) drought; (i) forest and land fire disasters.
- Students can identify activities before, during and after they occur: (a) geological and hydrometeorological disasters in Indonesia; (b) earthquake disaster; (c) tsunami disaster; (d) volcano disaster; (e) flood disaster; (f) landslides; (g) a tornado disaster; (h) drought; (i) forest and land fire disasters.
- Students can simulate activities before, during and after they occur: (a) geological and hydrometeorological disasters in Indonesia; (b) earthquake disaster; (c) tsunami disaster; (d) volcano disaster; (e) flood disaster; (f) landslides; (g) a tornado disaster; (h) drought; (i) forest and land fire disasters.

Figure 2. Specifications of learning outcomes and learning objectives of disaster mitigation

Based on Figure 2 regarding the specifications of learning outcomes and learning objectives of disaster mitigation is the main basis of analysis for designing KOASE: disaster mitigation learning media in primary schools are arranged into one theme and nine series. The theme used was Disaster Alert with: (a) a series of geological and hydrometeorological disasters in Indonesia; (b) earthquake disaster series; (c) tsunami disaster series; (d) series of volcanic eruption disasters; (e) flood disaster series; (f) series of landslide disasters; (g) a series of cyclones; (h) drought series; and (i) forest and land fire disaster series (Noviana, 2019; Akbar & Hartono, 2017; Sampurno, Sari, & Wijaya, 2015).

Design Stage

Based on the needs analysis conducted at the following define stage, a comic design is presented which refers to the specifications of learning outcomes and learning objectives as shown in Figure 3 below.

Figure 3. KOASE Design: Disaster Mitigation Learning Media in Elementary Schools

Based on Figure 2 above, at the beginning of the KOASE product: disaster mitigation learning media in elementary schools have a cover design designed with a dominant orange color and a little mix of green and yellow because orange looks bright and refreshing to the eye, especially if combined with a little green and yellow then the picture will be attractive and bright to the eye (Afendi & Arif, 2019; Heisler, 2017) and make elementary school students more interested in reading (Budiarti & Haryanto, 2016; Anafiah, 2014). The main part of the KOASE product: learning media for disaster mitigation in elementary schools provides an overview of the concepts and materials of disaster mitigation starting from (1) understanding, causes and impacts of disasters to be discussed; and (2) activities before the disaster, activities during the disaster and activities after the disaster;

and disaster management (Kastolani & Mainaki, 2018; Nandi & Marlyono, 2019; Nur Mustofa, 2010; Hardi, Darsihardjo, Ningrum, & Nandi, 2018; Amri, Bird, Ronan, Haynes, & Towers, 2017). This part of the content was developed starting from geological and hydrometeorological disasters in Indonesia, earthquake disasters, tsunami disasters, volcanic eruption disasters, flood disasters, landslides, tornadoes, drought disasters, and forest and land fires. And at the end, there is a list of terms compiled so that the reader (elementary school students) understand the meaning and purpose of the terms that are possible unknown (Kristiyaningrum, 2017).

Develop Stage

In the development of the final product (final draft) is obtained from KOASE: disaster mitigation learning media in elementary schools. This stage produces a product that has been validated and revised based on input from an expert validator (expert appraisal), user practitioners, namely elementary school teachers and elementary students during the trial process. The development phase is passed into two steps, namely:

a. expert validator (expert appraisal)

This stage is the stage for conducting validation or feasibility study of the product design that is developed. This activity is carried out by experts who are experts in the field of primary school teacher education. The suggestions given are used to improve the aspects of content, presentation, design, and color, language and suitability of the contents of the product design developed. Following are the results of expert validation for the product design developed which are presented in draft 1 and draft 2 as shown below:

Table 3. Feasibility data of Draft 1 and Draft 2 of design KOASE: Learning Media for Disaster Mitigation in Elementary Schools

Assessment Aspects	Average Expert Appraisal			
	Draft 1		Draft 2	
	Score	Categories	Score	Categories
Content	55.00	fairly decent	89.50	very feasible
Presentation	50.00	fairly decent	96.00	very feasible
Design and Color	52.00	fairly decent	92.00	very feasible
Linguistic	45.33	fairly decent	86.97	very feasible
Appropriate Content	53.33	fairly decent	92.28	very feasible
Average	**51.13**	fairly decent	**90.97**	very feasible

From the comic feasibility data of draft 1 and draft 2 above, five aspects are consisting of several indicators that are assessed by the validator. In the aspect of content, eight indicators are used to see the suitability and clarity of the content in the comics, the content aspect gets a score of 55.00 with a fairly decent category while in draft 2 the score becomes 89.50 in the very feasible category. Based on this data provides information that product design developed in this aspect is very feasible, so that KOASE learning media products can be used by teachers and students in learning. This content aspect provides information that the design of the product developed is in accordance with the essential material on disaster mitigation, this is in line with what was raised by Sung-Chin Chung & Cherng-Jyh Yen (2016) states that teachers or school administration need to do the planning and design good and collaborate between institutions in analyzing essential material about disaster mitigation, so as to facilitate students or readers in knowing and understanding the content of the material as a disaster mitigation information literacy. In addition, in developing essential material, it needs to be adjusted to the abilities and cognitive stages of elementary school students (Cherry, 2019) and one of the other supporting elements is to connect with local wisdom and the environmental conditions in which product design will be developed (Noviana et al., 2014).

Presentation aspects, there are two indicators used to see the presentation in comics, the score on the presentation aspect is 50.00 with a fairly decent category in draft 1 while draft 2 is 96.00 in the very feasible category. The presentation aspect is a very important element in developing learning media products in the form of comics. The comics developed need to have a primary identity and specificity (Tatalovic, 2009), interesting and easy to read (Liu, 2004), so that readers can get messages and easy information about disaster mitigation, and are expected to increase knowledge, abilities about disaster mitigation literacy (Hardi et al., 2018), disaster participation (Adiyoso & Kanegae, 2012; Mane, 2019) and preparedness in facing disasters (Tuswadi & Hayashi, 2014; Kastolani & Mainaki, 2018).

Aspects of design and color selection, there are eight indicators used to see how the design and selection as well as the suitability of colors in the product being designed, the score on the aspect of design and color selection of 52.00 with a category quite feasible while in draft 2 to 92.00 with the category very decent. The aspects of color selection and usage are very important because the color is chosen and used greatly influences the interest of the reader (teacher and elementary school students) and also gives meaning in the design of the product being developed. The use of colors that are dominated by orange gives a meaning that is bright, fresh and pleasing to the eye (Afendi & Arif, 2019). Therefore, good planning and design is needed in the use and selection of colors to develop two-dimensional print media products (Farinella, 2018; Suhardjo, 2015), so it is expected to be able to create interest and motivation to see and read (Budiarti & Haryanto, 2016), and can also affect the interest in learning of students who have low abilities (Arini, Choiri, & Sunardi, 2017).

The linguistic aspect, there are three indicators used to see the suitability of the language used in the comics, the score on the linguistic aspect is 45.33 with a fairly decent category while in draft 2 it becomes 86.97 in the very feasible category. The linguistic aspect is a very important element in designing and developing a KOASE: disaster mitigation learning media in elementary schools because the choice and use of words and sentences greatly influence the reader in understanding the contents of the reading. The selection and use of words must be adjusted to the ability of the reader, in terms of design and development of product designs that are developed adapted to the development of students who in this case are elementary school students. Therefore, in the process of designing the product developed, the researcher validates with a linguist (Indonesian) so that the selection and use of words are following the level of reading ability and skills of elementary school students (Maharani et al., 2019). In addition, the selection and use of words that are in accordance with the development of elementary school students can improve students' ability to read comprehension so that students can understand and interpret (Pourhosein Gilakjani & Sabouri, 2016; Kissau & Hiller, 2013) regarding concepts and essential materials about mitigation disaster in the design of products developed.

Aspects of content suitability, there are three indicators used to see whether the contents of comics can provide readers understanding of the contents of comics, aspects of content suitability of 53.33 with a fairly decent category and in draft 2 obtained a score of 92.8 in the very feasible category. The content suitability aspect provides information on whether the design of the product being developed has been able to provide readers with an understanding of

the content of essential material about disaster mitigation in elementary schools. Looking at the data that has been obtained from this aspect that the design of products developed in the form of comics as a medium of learning about disaster mitigation can be used in learning (Damopolii & Rahman, 2019; Heisler, 2017). This suitability has an impact on the ability of elementary school students to know and understand the various forms and natural disasters that exist in Indonesia and activities before, during and after natural disasters (Noviana, 2019).

The average feasibility of KOASE products: disaster mitigation learning media in elementary schools as a whole in draft 1 is 51.13 with a fairly decent category while the average worth of comics in draft 2 a whole is 90.97 in the very feasible category. Based on the analysis and information of all aspects analyzed and assessed by the validator, the design of the product developed, namely KOASE: disaster mitigation learning media in elementary schools is very feasible to be used in learning in elementary school students, so that it can have an impact and influence on the ability disaster mitigation information literacy (Hosler & Boomer, 2011), reading abilities and skills (Liu, 2004), student communication skills, providing curiosity and student motivation to learn (Budiarti & Haryanto, 2016), and most importantly being abilities and skills disaster alert for elementary school students (Nandi & Marlyono, 2019; Hardi et al., 2018).

These five aspects were tested by five validators as expert appraisal, consisting of two lecturers who validated the content of disaster mitigation material in elementary schools, one linguist lecturer to validate the selection and use of words, and two elementary school teachers who validate the suitability and usefulness of use in learning, both inside

and outside learning in elementary schools.

Based on input and assessment from the five validators above, the KOASE product design: disaster mitigation learning media in elementary schools that have been designed to be carried out changes or improvements on the advice of the validator. The following are examples of changes or improvements as seen in Table 4 below:

Table 4. Changes and Improvements to KOASE: KOASE: disaster mitigation learning media in elementary schools in the introduction part
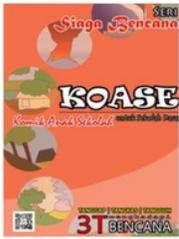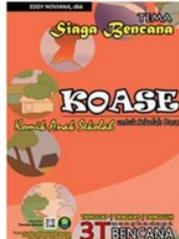
Based on Tabel 4 improvements made in the introduction part are adding the author's name at the top of the front cover, adding the roles and tasks to the cover page of the developer, adding an introductory page, and adding a table of contents page, and adding learning achievements.

Improvements made on the disaster mitigation series page are changes to the icon image that is more specific to the disaster that will be discussed or in other words describe the part of the content of the disaster that will be read and discussed by the reader (students) can be seen in table 5 below.

Table 5. Changes and Improvements to KOASE: KOASE: disaster mitigation learning media in elementary schools in series page

Before Validated	After Validated

Improvements to the content section are to add the name of the disaster to the top of the page, the page number to the top right, add the number to the dialog section, correct 17 colors and adjust the original object can be seen in table 6 below.

Table 6. Changes and Improvements to KOASE: KOASE: disaster mitigation learning media in elementary schools in the contents part

Before Validated	After Validated
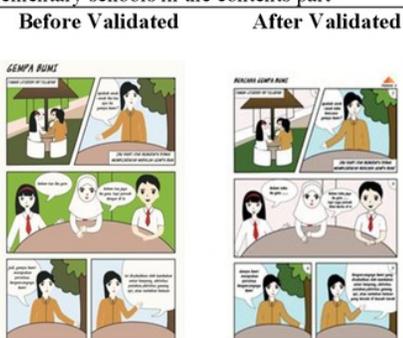
b. Developmental testing

The next step is to test the product design on the actual target subject. At the time of this trial the response data, reactions or comments from the target users were searched for using KOASE: disaster mitigation learning media in elementary schools. The trial results are used to improve the product to obtain decent results and can be used and utilized by teachers and students in learning (Liu, 2004; Heisler, 2017). At this stage, a limited trial is conducted to obtain information about the responses from the teacher and students after using the product design that was developed. The following is the teacher response data seen in table 7 below.

Table 7. Teacher Response Data on Product Trials

Assessment Aspects	Score	Categories
Content	92.78	Very good
Learning Media	95.00	Very good
Display	88.33	Very good
Linguistic	92.92	Very good
Average Teacher Response	**92.08**	Very good

Table 7 above provides information that overall the responses of teachers to KOASE: disaster mitigation learning media in elementary schools in the very good category with a score of 92.08. Acquisition of teacher response scores based on four aspects used, namely the aspect of content, aspects of learning media, aspects of appearance and aspects of language. The content aspect consisted of three indicators, namely comic material that was presented in full and obtained a score of 91.67. Indicators on the product developed, namely KOASE: disaster mitigation learning media in elementary schools can attract students' reading to score 93.33 and the disaster mitigation information indicators conveyed score 93.33, so for the content aspect it gets an average score is 92.78 in the excellent category. From the data obtained in this aspect proves that the product design developed can be used and utilized in learning (Rezkita, 2019), where the existence of KOASE as a learning medium can help elementary school students to increase their interest, interest

and motivation to read (Buchori & Setyawati, 2015) elementary school students and obtain clear information about concepts or essential materials about disaster mitigation so as to increase the knowledge and understanding of elementary school students as an effort to grow their abilities in dealing with disasters (Tuswadi & Hayashi, 2014; CONTRERAS, 2014).

For aspects of instructional media, a score of 95.00 was obtained in the excellent category. The acquisition of scores on this aspect of instructional media was obtained from three indicators developed, namely the ease of comic media indicators to increase students' motivation in learning disaster mitigation materials in primary schools to score 93.33. Comic media indicators broadening students 'insights on the concept and substance of disaster mitigation gained a score of 96.67 and the score of comic media ability indicators adding knowledge about students' disaster mitigation was 95.00. This data provides information that the product design developed makes it easy for students to understand the concepts and procedures of disaster mitigation (Heisler, 2017), adding insight into student disaster mitigation in elementary schools so that students in primary schools can be motivated in reading (Anafiah, 2014) and review the substance of disaster mitigation material presented in the design of products developed (Kristiyaningrum, 2017; Kastolani & Mainaki, 2018).

While in the display aspect obtained information on the response of teachers in the excellent category with a score of 88.33. The acquisition score of 83.33 is from the average of three indicators developed, namely the attractiveness indicator of the writing and type of letters used with a score of 86.67. The attractiveness indicator of comic disaster mitigation design obtained a

score of 86.67. Then for the attractiveness of color indicators, appearance and cover of disaster mitigation comics obtained a score of 88.33 and the text indicators in the comics obtained a score of 91.67.

For aspects of language use or linguistic aspects score 92.92 in the excellent category. The acquisition of scores on linguistic aspects is an average of the scores of the four indicators developed, namely the language indicators used by the level of cognitive development of students obtaining a score of 95.00. The language indicators used are easy to understand and get a score of 91.67. Then for the comic storyline indicator it is easy to understand getting a score of 93.33 and the accuracy of the terminology in the comic scores 91.67 Based on teacher response data after using KOASE: disaster mitigation learning media in elementary schools provides information that the design of products developed can be used by teachers as learning media (Indra Daulay, 2018) about disaster mitigation, both in learning or outside of learning in primary schools and can also be used as a learning resource used by teachers (Inang Prambudi, 2018) in providing material content and knowledge to elementary school students about disaster mitigation materials, so that it is expected to be able to influence the knowledge, understanding, abilities, and skills of teachers and elementary school students (Rosyida, Mustaji, & Subroto, 2018; Nurjannah, Wahyudi, & Setiawan, 2018; Hidayat & Rostikawati, 2018 in dealing with natural disasters.

Student response data after using KOASE: disaster mitigation learning media in elementary schools in learning can be seen in Table 8 below:

Table 8. Student Response Data on Product Trials

Assessment Aspects	Score	Categories
Content	88.33	Very good
Learning Media	90.83	Very good
Display	80.14	Very good
Linguistic	84.17	Very good
Average Student Response	**85.87**	Very good

Table 8 above provides information that overall student responses to KOASE: disaster mitigation learning media in elementary schools are in the very good category with a score of 85.87. Acquisition of student response scores based on four aspects used, namely aspects of content, aspects of learning media, aspects of appearance and aspects of interest. For the content aspect, it consists of two indicators, namely the material presented in the comic obtained a score of 90.00 and the material indicator delivered in the comic is interesting to read obtains a score of 86.67 so that for the content aspect the average score is 88.33 very good category. The learning media aspect gained a score of 90.83 in the excellent category. The acquisition of scores on this aspect of learning media was obtained from three indicators developed, namely the comic media indicator making it easier for students to understand the material and disaster mitigation activities to obtain a score of 86.67. Indicators by reading this comic, material knowledge and activities on disaster mitigation increased to a score of 93.33 and the score of comic media indicators can be used and studied, both alone and together is 95.00. Whereas in the display aspect obtained information on the response of students in both categories with a score of 80.14. The acquisition of a score of 80.14 from an average of six indicators developed, namely the comic cover indicator is very interesting with a score of 74.17. The picture indicators contained in the comics are interesting for students to get a score of 80.83. Then for the color indicators used in interesting comics, a score of 85.83 was obtained. The paper indicators

used are very good and safe getting a score of 80.00. And for the type of letter indicator used, it was interesting to get a score of 84.17 as well as a compact and easy-to-carry comic media size indicator, a score of 75.83. And in the aspect of student interest in the KOASE comics, it scored 84.87 in the excellent category. For more details can be seen in Figure 4 below.
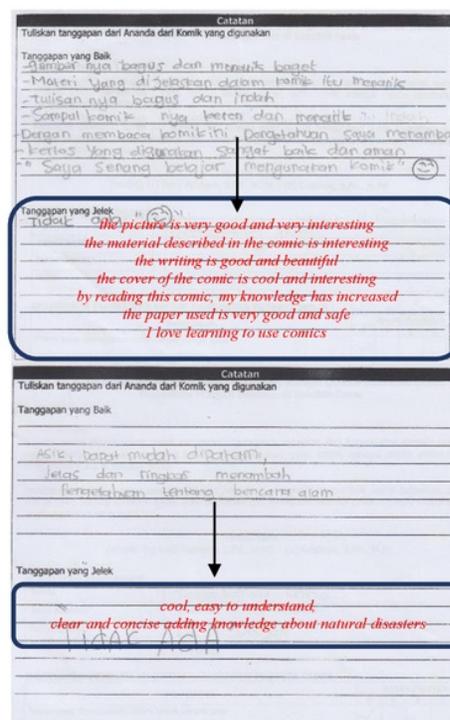
Figure 4. Elementary school student responses after using the KOASE product design

Based on student response data after information is obtained that the product design developed can be used by students, both in learning and outside of learning, this is evidenced that the product design developed can provide clear information to students about disaster mitigation material, increase student reading interest, and make it easy for students to understand the content and material about disaster mitigation.

CONCLUSION

KOASE: disaster mitigation learning media in elementary schools are feasible and can be used by teachers and students in learning about disaster mitigation materials in primary schools and can be used as sources and learning materials for disaster mitigation information literacy. Eligibility at the product design stage assessed by expert validators (expert appraisal) was 51.13 with a fairly decent category in draft design 1 increasing to 90.97 with a very feasible category in draft 2. Data on teacher and student responses at the development stage obtained scores 92.08 with a very good category for the teacher's response score and a score for student responses obtained a score of 85.87 with a very good category.

Suggestions for the next researcher is to develop comics that are more specific to one type of natural disaster so that they can explore the depth of essential material from one of the natural disasters. Then for the teacher that this comic can be used as a source of additional reading and learning media in teaching material about disaster mitigation.

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