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Development of Audio Visual Media Using Diorama Food Chain Materials for Class V Elementary School

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ABSTRACT: This study aims to develop audio-visual media using valid and practical dioramas for food chain material for fifth grade elementary school. The development model used is 4-D, which consists of 4 stages: define, design, develop, and disseminate. The development of this product was in the form of a learning video which was validated by 2 media experts and 1 material expert, the practicality test was carried out by 3 teachers and 10 students of class V, while the product trial was conducted on 20 students of class V. Based on the results of data analysis, media expert validation I obtained an average percentage of 100% with a very valid category, media expert validation II obtained an average percentage of 93.75% with a very valid category, material expert validation obtained an average score of 85% with a category very valid, Practicality by the teacher shows an average score of 95.14% in the very practical category, practicality by students gets an average score of 98.69% in the very practical category, the student response questionnaire shows an average score of 98.53% in the category very good, and the average result of the student's ability test shows the number 86.5 in the good category. So, this food chain learning video in the rice field ecosystem has been tested to be valid and practical, so that it can be an innovation in learning in elementary schools.
Keywords: Audio Visual Media, Dioramas, Science Learning.

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INTRODUCTION

Science learning is a basic learning that must be learned from an early age, because science learning is a collection of various fields of study that are very broad, ranging from studying oneself to studying the natural surroundings which are very closely related to human life. Samatowa (2006) stated that Science learning is a science based on the results of experiments and observations made by humans regarding the phenomena of the universe that are arranged systematically. Natural science is a compulsory subject taught in elementary schools. It is intended that from an early age students can think and behave scientifically about the natural environment that contains facts, concepts and generalizations. However, most students consider science subjects to be difficult learning so they are not liked (Susanto, 2013). Science learning is considered difficult and boring due to the teacher's lack of ability in delivering teaching materials.

Teachers have a very important role in teaching activities in the classroom. Without a teacher, students will not be able to develop their interests and talents optimally (Mulyasa, 2009). Therefore, teachers must facilitate students to learn actively and independently to improve understanding of concepts in the material being taught, so students will be motivated to learn, so that learning objectives can be achieved. However, the lack of availability of science learning media, contains the learning process more using the lecture method (Hazmiwati, 2018). Most teachers only use textbooks as a reference in teaching and use the help of learning media in the form of pictures, so students still find it difficult to understand the learning material (Amalia, et al., 2017). In real conditions, various learning media are still rarely used by teachers, this is due to various reasons, namely the limited time and cost for making learning media (Priansa, 2017).

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Teachers are required to be able to develop learning tools such as learning media. The learning media needed is media that can facilitate teachers in delivering learning and can stimulate students' thinking power to learn. The appropriate learning media used for elementary school students is me media that can describe or provide experiences with actual (concrete) situations. Through the media is expected to attract students' attention and increase student interest in learning.

Based on a preliminary study conducted by researchers at SD Negeri 002 Tambusai Utara, it showed that they had not used technology-based learning media that could attract students' attention and had not provided direct experience so that the learning provided was less meaningful.

Food chain material is material that contains an explanation of how the process of eating and being eaten between living things in an ecosystem. This material needs to be taught in elementary schools with the aim of making it easier for students to know and understand the level or class of living things. However, it is not possible if students are asked to observe food chain processes that occur directly in nature, so that in food chain material, media is needed that can facilitate student learning activities (Lusidawaty, et al., 2020). Media Learning materials used in food chain materials are still limited to textbooks and illustrated images.

One of the media that can be used is audio-visual media using dioramas. Diorama is a type of 3-dimensional (3D) media that can be seen from all sides (Abrar, 2018). Innovative 3-dimensional food chain diorama media can make it easier for students to understand food chain material in nature. Sudjana (in Amalia, et al., 2017) said that the diorama aims to describe the real situation in the classroom in the form of a 3-dimensional view. Through audio-visual-based diorama media, learning will be more fun and attract students' attention. This audio-visual media makes it easier for students to receive information and avoid misunderstandings.

Judging from the results of previous research, it concluded that audio-visual media using dioramas can make it easier for students to understand learning materials (Nadhliroh and Fitria, 2018; Abrar, 2018; Handayani, 2018; Amalia et al, 2017). Various studies that have been conducted have not discussed the material on theme 5 (Ecosystem), sub-theme 2 (Relations between Living Things in Ecosystems) about the food chain for fifth grade elementary school with audio-visual media using dioramas.

The use of audio-visual media in the learning process can attract students to understand the teaching material, foster learning motivation, and can provide direct experience to students regarding the material being studied. With the use of audio-visual media is expected to achieve the learning objectives that have been set.

Based on these problems, the authors conducted a study entitled "Development of Audio Visual Media Using Diorama Food Chain Materials for Class V Elementary School".

METHOD

The development model used is 4-D which refers to Thiagarajan's opinion (Sugiyono, 2019). This 4-D development model consists of four stages, namely: Define (containing activities to determine what products need to be developed), Design (containing activities to design a product to be developed), Develop (containing activities in making and testing products so that they reach specifications). that has been determined) and Disseminate (products whose validity has been tested will be disseminated for the benefit of others) (Sugiyono, 2019).

The object of this research is the development of audio-visual media using dioramas as learning media on theme 5 (Ecosystem), sub-theme 2 (Relations between Living Things in Ecosystems) about the food chain for fifth grade elementary school. While the subject of this development research is the fifth grade students of SD Negeri 002 Tambusai Utara, totaling 20 students.

Sources of data in this research and development were obtained from expert validator tests (material experts and media experts), practicality tests (teacher and student practicalities) and product trials (student response sheets and students' understanding ability tests). Meanwhile, the instruments used in this study were questionnaires and tests of students' understanding abilities.

The technique used in collecting data in this study is by giving a questionnaire to 2 media expert validators and 1 material expert validator. Practicality questionnaires were given to 3 fifth grade teachers and 10 students. Student response questionnaires were given to 20 class V students, accompanied by a

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student comprehension test sheet. While the data analysis technique used is quantitative data analysis to process the data obtained through questionnaires and tests of students' understanding abilities. Aspects of assessment used in this study were made in the form of a Likert scale with a range of 1-4. The categories of assessment by validators can be analyzed using the following formula:

$$P = \frac{X}{Y} \text{x } 100\%$$

Information:

P = Product validation value

X = Score obtained from validation results

Y = Maximum score obtained from validation results

Table 1. Percentage of Product Validation Criteria

No	Interval mean score (100%)	Category
1	81 – 100	Very Valid
2	61 – 80	Valid
3	41 – 60	Quite Valid
4	21 – 40	Less Valid
5	0 – 20	Invalid

Source: Modification (Sugiyono, 2019)

RESULT AND DISCUSSION

RESULT

1. Defining Stage

The definition stage is the first stage carried out in research to obtain information related to the needs needed in product development. This stage consists of several steps, namely: a) Curriculum analysis, the curriculum used in SD Negeri 002 Tambusai Utara is the 2013 Curriculum. theme 5 (Ecosystems), sub-theme 2 (Relations between Living Things in Ecosystems) about the food chain. b) Student analysis, this is useful for adjusting student learning interests with the product to be developed. According to Piaget (in Ananda, 2017) states that the development of elementary school children, which in the age range of 7-12 years children experience concrete operational development. At this stage children tend to group objects in real terms, so that in the learning process children are easier to understand learning material by using media that can illustrate the content of learning material in a real direction or according to the actual situation. c) Material analysis carried out by researchers is by identifying the material to be studied by students, collecting material content from various references and selecting material that is relevant to the material studied by students. d) Formulating the objectives is carried out by the researcher to determine the content of the material to be presented in the learning video, so that the development objectives to be obtained do not deviate from the provisions.

2. Design Stage

The design stage consists of several steps, namely:

a. Designing a Rice Field Ecosystem Diorama

The design of the rice field ecosystem diorama is divided into two stages in its manufacture, namely the manufacture of rice fields that are used as ecosystems and the creation of characters who become the main characters in conveying the contents of the food chain story in the rice field ecosystem.

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Figure 1. Rice Field Diorama

Figure 2. Characters

b. Shooting

This step begins by making a script for the food chain story in the rice field ecosystem, which serves as a scene guide which can later make it easier for researchers to determine the movement of the characters or objects used. The next step is to prepare a tripod and camera to produce a stable image, and prepare the characters or objects needed for shooting such as: toy mice, toy snakes, and toy eagles.

Figure 3. Image Capture Process

c. Video Editing

After shooting is complete, the next step is video editing using the KineMaster application. At this stage, the images that have been taken by the researcher are combined. Making this learning video uses a stop motion technique that uses many images to create a movement as if the object looks alive. Next, the voice is filled in according to the characters. The voices used by various characters come from the voices of the researchers themselves, which will then be subjected to a voice changing process to be able to distinguish the voices of the characters. The sound of a mouse is edited through a chipmunk voice changer, a snake's voice with a voice changer to a monster, and an eagle's voice with a male voice changer.

Figure 4. Merging Images on the KineMaster Application

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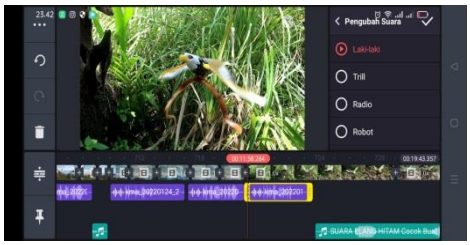

Figure 5. Voice Charging on the KineMaster Application

3. Development Stage

This development stage contains activities that seek to create and modify audio-visual media using dioramas. Previously, a search and collection of several relevant sources related to audio-visual media was carried out using dioramas, making a conceptual framework for media development, and validating media development products, as well as revisions after receiving input from several experts.

a. Expert Validation

The validation of the learning video development was carried out with 3 validators consisting of 2 media expert validators and 1 material expert validator. The assessment of the media expert and material expert validator is based on several aspects, namely: material, design, language and audio.

Table 2. Data Validation of Media Experts I

No	Assessment Aspect	Percentage	Category
1	Theory	100%	Very Valid
2	Design	100%	Very Valid
3	Language	100%	Very Valid
4	Audio	100%	Very Valid
Average Percentage		100%	Very Valid

Table 3. Data Validation of Media Experts II

No	Assessment Aspect	Percentage	Category
1	Theory	100%	Very Valid
2	Design	100%	Very Valid
3	Language	87.50%	Very Valid
4	Audio	87.50%	Very Valid
Average Percentage		93.75%	Very Valid

Table 4. Material Expert Validation Data

No	Assessment Aspect	Percentage	Category
1	Theory	87.50%	Very Valid
2	Design	90%	Very Valid
3	Language	87.50%	Very Valid
4	Audio	75%	Valid
Average Percentage		85%	Very Valid

Table 5. Comparison of Improvements Before and After Media Expert Validation I

No	Before Validation	After Validation
1		

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No	Before Validation	After Validation
2		

Improvements made in Figure 1 are, varying the type of font and color on the display of the learning video in the sentence "What is a food chain?" the type of font used is soapy hands bold, changed to league gothic and for the display color of the letters which was originally black and purple, it was changed to red and yellow. In the paragraph on the definition of the food chain along with examples, the purple background was changed to orange. In figure 2, which is varying the type of font and adding relevant images related to the material, the word "consumer" the type of font used is soapy hands bold changed to junction and also adding images that are in accordance with the explanation on the consumer component so that the learning video display becomes interesting.

Table 6. Comparison of Improvements Before and After Media Expert Validation II

No	Before Validation	After Validation
1		

Improvements made are the addition of an explanation at the end, namely "maggots" not only act as decomposers. However, when decomposers break down soil into plant food extracts, it means that maggots act as "producers" and rice acts as "consumers".

Table 7. Comparison of Improvements Before and After Material Expert Validation

No	Before Validation	After Validation
1		
2		

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No	Before Validation	After Validation
3		

Improvements made in Figure 1 are the use of images of maggots instead of mushrooms, because they are not in accordance with the components that make up the food chain as decomposers. For example, if the level III consumer is a dead eagle, it will be decomposed by maggots as decomposers and not fungi. In Figure 2, which changes the image of mushrooms to maggots as decomposers and the validator suggests adding examples of food chains in other ecosystems, one example is the food chain in river ecosystems. In Figure 3, it provides reinforcement in the video learning material on the food chain in the rice field ecosystem. With a re-explanation at the end of the learning video and equipped with pictures, students will easily understand the learning material.

b. Practical Test

This practicality test was conducted on 3 fifth grade teachers from different schools, namely: SD Negeri 002 Tambusai Utara, SD Negeri 017 Tambusai Utara and SD Negeri 134 Pekanbaru. Practicality tests were also conducted on 10 fifth grade students of SD Negeri 002 Tambusai Utara (for the selection of students based on their abilities, namely: smart, moderate and need guidance).

Table 8. Teacher Practicality Test Results

No	Assessment Aspect	Average Percentage	Category
1	Attractiveness	97.22%	Very Practical
2	Ease of Use	93.75%	Very Practical
3	Benefit	94.44%	Very Practical
	Average	95.14%	Very Practical

Table 9. Students' Practicality Test Results

No	Assessment Aspect	Average Percentage	Category
1	Attractiveness	98.33%	Very Practical
2	Ease of Use	99%	Very Practical
3	Benefit	98.75%	Very Practical
	Average	98.69%	Very Practical

c. Product Trial

The product trial was carried out on fifth grade students of SD Negeri 002 Tambusai Utara by providing questionnaires and tests that functioned to see students' responses to the product design developed, while the test aimed to see the level of students' understanding of the material through learning videos.

Table 10. Student Responses on Product Trials

No	Assessment Aspect	Average Percentage	Category
1	Attractiveness	98.33%	Very good
2	Ease of Use	98.50%	Very good
3	Benefit	98.75%	Very good
	Average	98.53%	Very good

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Table 11. Results of Students' Understanding Ability

No	Student Name	Student Value
1	Student-1	100
2	Student-2	100
3	Student-3	100
4	Student-4	100
5	Student-5	90
6	Student-6	90
7	Student-7	90
8	Student-8	80
9	Student-9	80
10	Student-10	80
11	Student-11	70
12	Student-12	90
13	Student-13	70
14	Student-14	70
15	Student-15	100
16	Student-16	80
17	Student-17	100
18	Student-18	100
19	Student-19	70
20	Student-20	70
	Xi	1,730

After obtaining student scores, the next step is to find the average value of students' abilities by using the following formula:

$$Me = \frac{\sum xi}{n}$$

$$Me = \frac{1.730}{20}$$

$$Me = 86.5$$

4. Deplopment Stage

After the learning video is declared valid and practical, the next step is to disseminate the learning video on food chain material in the rice field ecosystem. The dissemination stage was carried out by sharing learning videos through social media, such as YouTube with the address https://youtu.be/tw2DjtfTvp0. The learning video has been uploaded via YouTube since March 5, 2022 and on March 16, 2022 the video has been watched 260 times. This is done because nowadays children are no stranger to the virtual world such as social media. So that with lots of content such as learning videos, it can make it easier for students to understand learning with an attractive appearance. This is evidenced by the audience who watched the learning video giving good comments.

DISCUSSION

Audio-visual media using dioramas in the form of videos can be used to make it easier for students to understand learning, encourage students to be more active in learning and can make the learning process more interesting (Wafa & Ria, 2019). The results of the research that have been obtained conclude that audio-visual media using food chain dioramas is appropriate for use in grade V elementary school.

The results of this study are supported by the results of previous research, namely Nadhliroh & Fitria (2018) which stated that from the percentage of eligibility by expert validators, the responses of teachers and students using audio-visual-based diorama media were feasible and effective to use in social studies learning material for the formation of the Republic of Indonesia. As well as research by Amalia et

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al (2017) concluded that diorama media is appropriate for use in grade IV elementary school on the theme of the beauty of my country.

Based on the results of the study, it is shown that audio-visual media using dioramas is useful if used in learning. According to the results of Weranti's research (in Nadhliroh & Fitria, 2018) explained that three-dimensional diorama media affect students' cognitive learning outcomes. Ananda (2017) in his research shows that the use of audio-visual media can improve student learning outcomes in Civics learning in grade IV. Abrar (2018) in his research explains that diorama media can help teachers explain the concept of learning and students can observe it directly, so that contextual-based diorama media can support the learning process in elementary schools.

CONCLUSION

Based on the results of the research and discussion that has been carried out, the researchers conclude that this research has been successfully developed using the 4-D development model according to Thiagarajan (Sugiyono, 2019). The product developed has been tested valid and practical for use in grade V elementary school students, this can be seen from the average percentage gain for media expert validation I which is 100% with a very valid category, media expert validation II is 93.75% with very valid category, material expert validation with an average percentage of 85% with a very valid category, the average percentage of practicality by the teacher is 95.14% with a very practical category, the average percentage of practicality by students is 98.69% with a very practical category and the student's response to the product trial obtained an average percentage of 98.53% with a very good category.

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