

Development of Learning Videos Based Discovery Learning for Class V Elementary School Temperma Material

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ABSTRACT

This study aims to determine the feasibility of learning videos based on Discovery Learning of human respiratory system content in science class V SD No. 1 Mengwi. The research method used is 4D (Define, Design, Development, Disseminate). In collecting the research data, it is prioritized to use a questionnaire method and complete interviews and observations. The data analysis techniques used in this study are quantitative analysis and qualitative analysis. In this study the data were sourced from students, homeroom teachers of SD No. 1 Mengwi and experts who reviewed the product. The feasibility of the product can be known through the results of the validation of the subject matter content experts, learning design experts and instructional media experts. The results of the assessment of the subject matter content experts obtained a percentage result of 92.30% with a very good category, the results of the assessment of the learning design expert obtained a percentage of 88.80% with a good category, the results of the assessment of the instructional media experts obtained a percentage of 92.30% with a very good category, and the results of the assessment from individual trials obtained a percentage of 93.36%. Based on the results of validation from experts, the learning video based on Discovery Learning of human respiratory system material on science content is suitable for use in the learning process.

Keywords: Video, Discovery Learning, Human Respiratory System

1. INTRODUCTION

Learning is a process of educational interaction that is bound to the goals, directed and finished specifically to achieve learning purposes. The process of achieving needs to be done by selecting teaching material so that it can be absorbed optimally by students, so in education teacher must implement appropriate learning strategies supported by adequate learning media to what extent the learning objectives are achieved, a series of evaluation activities have to be done [1]. Along with this statement [2] states that learning is essentially an effort process did by a person to obtain a whole new change in a whole, as a result of their own experience in the interaction with the environment. Today, the learning process is doing by online due to the COVID 19 pandemic. Teachers are urged to do face-to-face or offline learning. This is a challenge to all teachers to keep the classrooms active even though face-to-face schools are disabled. Teachers must be able to innovate and be creative so that the learning process can be finished well [3].

The teacher as an educator who is an important element in learning requires to interact and transfer knowledge online Kurniawan [4]. Online learning can take advantage of the applications provided either via WhatsApp, Line, Zoom, Jitsi, Meet, etc. The various available applications can be used to support knowledge transfer which is supported by various discussion techniques and others Purwanti [5]. However, at SD No. 1 Mengwi, online learning in one of the science subject which is human respiratory system materials, is less effective because the teacher only sends a link of the learning video without explaining it again and the video content is unclear, only displays images of human respiratory organs without being shown with circle mark or other. Therefore, not all online learning can be doing optimally, so we need a learning media that has more advantages than videos sent by the teacher. Fauzan [6] states that learning media is very important to use during the learning process both offline and online. Learning media is a mediator between sources and recipients that contains important information so it is conveyed well and

clearly. Learning media is divided into 3 types, namely Auditive, Visual, and Audiovisual [7]. Along with this statement, the definition of learning media is something that contains information and knowledge that can be used to do the learning process, media used to support learning activities to acquire knowledge, skills, and attitudes [8].

In line with this statement, the results of research [9] entitled *Pengembangan Video Pembelajaran Animasi Sistem Pernapasan Manusia Sebagai Upaya Mendukung Kebijakan Belajar di Rumah Malang* states that video is a medium for delivering messages including audio visual media or listening perspective media, audiovisual media includes pure audiovisual and not pure audiovisual while the video includes pure audiovisual. Rebowo [10] media means a tool to connect learning information or transferring messages. The use of media as a learning tool that contains information and knowledge is generally used to make the learning process more effective, efficient, and enjoyable. In the learning process, the media plays an important role in conveying and delivering messages and information. By utilizing media and technology, the process of delivering messages and information between senders and recipients will be able to take place effectively.

Riyanto & Ujang [11] The use of learning media is proofing the application of technology in the 2013 Curriculum, where media is an important tool for students to be able to understand the material optimally. If you pay attention to learning media, it is very important to the mediator as an educator to deliver material to students, as a result, the development of instructional video can be an alternative solution in solving online learning problems.

Darmanta [12] states that video learning is a media that presents audio and visuals containing learning materials that consist of concepts, principles, procedures, knowledge application theory to help to understand the subject taught. In line with this statement [13] states that video learning is a media that is systematically designed based on the applicable curriculum and in the development of it applying learning principles so the program allows students to view the subject matter more easily and interestingly.

Video development can have an impact on the student learning process, namely: 1) facilitating students to learn independently and finding the connection between subjects, 2) developing scientific thinking for elementary students by following scientific steps in science through a scientific approach, 3) making it easier to understand the material through pictures and videos, and 4) students can use the video repeatedly so that it supports a deep understanding [14]. Therefore we need a learning video media that has advantages at the step of the learning process, which is based on Discovery Learning which can help students understand the material of the human respiratory system more easily and meaningfully so that

students can receive the subject of the human respiratory system as a whole with the help of video media. Discovery Learning-based learning.

Herawati & Wahyudi [15] states that Discovery learning is a learning process in which a concept is not presented in a final form, but students are required to organize their learning methods in finding concepts. Discovery occurs when individuals are involved, especially in the use of mental processes to discover several concepts and principles. Discovery is doing through observation, classification, measurement, prediction, determination, and inferior [16]. In the real learning concept, the Discovery Learning method is the formation of categories or concepts that can make generalizations possible, related to Bruner's theory of categorization which appears in the discovery that the formation of categories or more often called Widiyasanti's coding system [17].

Silmi [18] states that the learning process is more concerned with the active participation of each student and to know well the differences in abilities. To support the learning process, an environment is needed to facilitate curiosity to support the learning process at the exploration stage. This environment is called a discovery learning environment, which is an environment where students can explore new findings that are not known yet or understandings that are similar to what is already known. An environment like this is aimed so the students can run well and smoothly in the learning process [19].

Megawati [20] states the steps of the guided discovery learning model are as follows: 1) Stimulation, namely formulating problems that will be given to students with enough data. The formulation must be clear and eliminating the statements that have multiple interpretations, 2) Problem Statements, namely based on the data provided by the teacher, students compile, process, organize, and analyze the data. In this case, teacher guidance can be provided as far as needed, guidance is more directed towards the steps to be conveyed through questions, 3) Data Collection, namely students compile the guess from the results of the analysis they have done, 4) Data Processing is if it is necessary, the estimation that has made by students should be checked by the teacher, this is important to ensure the truth of the student's predictions so that they will be directed in the right direction which needs to be achieved, 5) Verification, that is, if the certain result has been obtained about the correctness of presumption, the verbalization of the presumption should be submitted to students to feed them. Besides, it is necessary to remember that induction does not guarantee 100% correct of the prediction, 6) Generalization, namely after students find what they are looking for, the teacher should provide practice questions or additional questions to check whether the findings are correct. The six stages must be done in a structured manner so that the delivery

of science material can be doing effectively. Science lessons are subjects that are considered difficult by students because the material is abstract so that students often get confused in understanding the material.

Fadhli [21] states that the 2013 Primary School curriculum, which is Science, aims to develop student attitudes, knowledge competencies, and skills competencies. In this learning activity, students are required to actively search by themselves using a scientific approach [22]. In this curriculum, students are expected to be able to apply the learning that has been done into the life of society, nation, and state. In this case, teachers, especially those who teach science in elementary schools, are expected to know and understand the nature of science learning, so in science learning teachers have no difficulty in designing and implementing learning [23]. Students who do the learning also have no difficulty understanding the concept of science.

In line with this statement, Permatasari [24] states that the science education learning process is related to the cognitive aspects of students, which is expected to provide meaningful understanding even though the learning process is online. Science subjects are subjects that have been considered difficult by most students start from elementary to high school levels [25]. Natural science, which is often referred to as science education, is abbreviated as IPA. The assumption of most of the students who stated that this science lesson was difficult was proven by the results of the final school exams (UAS) reported by the Ministry of National Education which were still very far from the expected standard [26].

One of the problems faced by the education field today is the weak implementation of the learning process applied by teachers in schools [27]. The learning process that has occurred so far has not been able to develop the thinking skills of students. The Content of Natural Sciences (IPA) is one of the main subjects in the education curriculum in Indonesia, including at the Hafizh primary school level [28]. Science content has several competencies such as showing a scientific attitude, honesty, logical thinking, and discipline through science. As well as observing science objects using the five senses and telling the results of science observations in the vivid language [29].

Discovery Learning-based learning videos can solve problems faced by students because in the learning videos it is completed with a structured and systematic explanation and in the Discovery Learning-based learning videos it displays images of human respiratory organs equipped with circles to designate respiratory human organs so the students are not confused with the material described.

Learning videos based on Discovery Learning of human respiratory system material for fifth grade at SD

No 1 Mengwi aims to identify the feasibility of the product being developed. Also with the problems that have been described, a learning media in the form of videos is needed to explain the material of the human respiratory system better than the previous videos and make the learning process more meaningful, active, and creative. So it is very necessary to develop a learning video based on Discovery Learning to solve the problems experienced by students.

2. METHODS

The method used in this study is classified into research and development (Research and Development / R&D) methods. This research method is to develop and update products to produce them. The type of research design is used in research and development regarding the 4D or Four-D Define research method, Design, Development, Disseminate (Spread). The stages of this research method are presented in Figure 1.

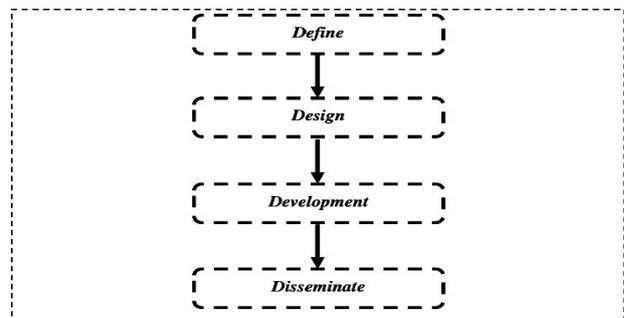


Figure 1. 4D Stages Model [30]

In the development of science learning videos using the 4D model that chosen as a guide in developing Discovery Learning-based science learning videos, this model has a complete, simple, and easy understand description, namely, define to decide and interpret the learning needs At the defining stage, it has a goal, namely to analyze and determine the conditions of learning. There are five sub-stages at the defining stage, namely preliminary and final analysis, student analysis, task analysis, concept analysis, and formulation of learning objectives. The preliminary analysis aims to identify the basic problems faced in the online learning process. Student analysis aims to identify the characteristics of students that will affect the design of product development. The characteristics of students identified including background knowledge. Concept analysis is to identify the main concepts to be taught. The analysis that needs to be done is an analysis of main competencies, basic competencies, and analysis of learning resources. Task analysis aims to identify the main skills that will be learned by researchers.

The design of planning the prototype of the science learning video at this design stage aims to design the characteristics of the development product. Four sub-

stages must be finished in this stage, namely the preparation of guide reference test criteria, media selection, format selection, and initial design. Material, the choice of format in product development is intended to design learning content, approaches, and learning resources. The initial design is done by designing all the equipment of development product and research instruments.

Develop to produce discovery learning-based science video through development stages, is testing experts and individual trials to produce development products and disseminate that has planned, also the stages of distributing learning videos so that they can be used by students.

The implementation of product validation by experts was implemented on December 29, 2020, by learning

design experts and instructional media experts, as well as on January 4, 2021, by subject matter content experts, and on January 11, 2021, done by individual tests at SD No.1 Mengwi. The techniques that were used to collecting the main data in this study were questionnaires and completed with interviews and observations. The questionnaire method is a way of obtaining or collecting data by sending a list of questions/statements to respondents/research subjects. The interview method is a method of collecting data by the meaning of systematic question and answer, and the results of these questions and answers are recorded carefully. While the observation method is a way to assess by making direct and systematic observations. The grid for this research instrument is as follows.

Table 1. Subject Content Expert Questionnaire Grid

Aspects	Indicators	Grain	Number of Items
Curriculum	a. Basic competencies b. Indicators c. Goal	1, 2, 3	3
Material Content	a. Material truth b. Material provision c. Depth of matter d. The attractiveness of the material e. Conformity of the material to the characteristics of students f. The material is easy to understand g. Material presenting real life h. The concept of material can be analogous	4, 5, 6, 7, 8, 9, 10, 11	8
Grammar	a. Proper and consistent use of language b. The language used corresponds to the characteristics of the student	12, 13	2
Amount			13

Source: [31]

Table 2. Design Expert Questionnaire Grid

Aspects	Indicators	Grain	Number of Items
Goal	a. Clarity of purpose b. Consistency between goals, materials and evaluations	1, 2	2
Strategy	a. Submission of material b. Learning activities c. Setting an example for understanding concept d. Providing students with the opportunity to learn independently	3, 4, 5, 6	4
Evaluation	a. Presentation of question b. Clarity of instructions on question c. Providing feedback	7, 8, 9	3
Amount			9

Source: [31]

Table 3. Learning Media Questionnaire Grid

Aspects	Indicator	Grain	Number of items
Technical	a. Ease of using media b. The media can assist students in understanding material c. Media can provide motivation for students in learning d. Students can replay video media e. Effective video time duration for students' learning	1, 2, 3, 4, 5	5
Display	a. Readability of text b. Consistency of theme	6, 7, 8, 9, 10,	10

Aspects	Indicator	Grain	Number of items
	c. Use of images that support material d. Use the right typeface, font size and spacing e. Precise and matching composition and color combination f. Proper use of animation g. Support appropriate accompaniment music h. The use of the right sound effect i. The use of the appropriate narrative j. Compatible and balanced screen display	11, 12, 13, 14, 15	
Amount			15

Source: [31]

Table 4. Learning Media Questionnaire Grid

Aspects	Indicator	Grain	Number of items
Packaging	a. Learning video media	1	4
	b. Easy learning materials understood	2, 3, 4	3
	b. Clarity of learning materials c. Learning activities that include (Introduction, core, and closing)		
Material	a. Media is able to motivate learners in learning	5	1
Evaluation	a. Clarity Instructions for work on question	6, 7, 8, 9	4
	b. Balance the proportions of the problem with material		
	c. Problem according to material		
	d. Language is easy to understand Image clarity		
Amount			9

Source: [31]

In giving score to the validation analysis is by using Likert scale with the following steps: 1) The validator puts a checklist in the statement column; 2) The validator gives a score on a scale of 4 with a statement that score of 4 (very good), score of 3 (good), score of 2 (not good), and score of 1 (very bad); 3) Adding up the score criteria selected by the respondent; 4) Calculating the maximum ideal score from the text items with the maximum criteria score; 5) Looking for the results of the validation value using the following formula.

$$P = \frac{\sum x}{N} \times 100\% \quad (1)$$

Information :

- P = acquisition percentage of validator
- $\sum x$ = The number of criteria score selected by the respondent
- N = Total score

3. ANALYSIS AND DISCUSSION

Validation assessments for subject matter content experts consist of curriculum aspects (3 points of assessment), material content aspects (8 points of assessment), grammar aspects (2 points of assessment), learning design experts consist of objective aspects (2 points assessment), strategic aspects (4 points of assessment), evaluation aspects (3 points of assessment), for instructional media experts consisting of technical aspects (4 points of assessment), text aspects (2 points of assessment), picture aspects (4 points of assessment), as well as sound aspects (3 points of assessment), and for individual tests consisting of packaging aspects (1 point of assessment), material aspects (3 points assessment),

evaluation aspects (1 points assessment), motivational aspects (4 points of assessment). Each validation assessment uses a scale of 4 (Likert scale) with categories 4 (very good), 3 (good), 2 (not good), and 1 (very bad). The following are the results of the validation assessment of subject matter content experts, learning design experts, and learning media experts in table form, as follows.

Table 5. Lesson Content Experts

Aspects	Number of Items	Score
a. Curriculum	3 items	11
b. Material Content	8 items	29
c. Grammar	2 items	8
Amount		48
Percentage		92.30%
Category		Excellent

Table 6. Learning Design Experts

Aspects	Number of Items	Score
a. Goal	2 items	7
b. Strategy	4 items	11
c. Evaluation	3 items	4
Percentage		88.80%
Category		Good

Table 7. Expert Media Lessons

Aspects	Number of Items	Score
a. Technical	2 items	7
b. Text	2 items	8
c. Picture	3 items	11
d. Sound	3 items	12
Amount		63
Percentage		92.30%
Category		Excellent

Table 8. Individual Trial Assessments

No	Subject	Percentage Value
1.	1	88.88
2.	2	97.20
3.	3	94
	Amount	280.08
	Average	93.36%

The validity of a product is known through validation assessments from experts, the assessment is valued based on several aspects related to the product being developed and obtaining suggestions or comments from the validator so that the developed product will receive revisions to improve the developed product. Based on expert reviews, suggestions and revisions are as follows.

Table 9. Input from the Validator on the Product

No	Validator	Feedback/Suggestions
1	Content Experts	For the naming of human respiratory organs closer to the organ directly, do not put the name of the organ too far.
2	Media Experts	It is best to explain the respiratory organs in addition to being appointed, complete with a circle so that students can easily understand them
3	Design Experts	In the video for the photos of the hero it would be nice to be eliminated so as not to make the student's focus disappear.

The results of the review of the subject matter content experts for discovery learning-based learning videos for the material of the human respiratory system in fifth grade at SD No.1 Mengwi obtained a total score of 48 with a percentage of 92.30% (very good), the assessment of the learning design experts results for the material discovery learning based learning videos The human respiratory system fifth grade SD No.1 Mengwi obtained a total score of 48 with a percentage of 88.80% (good), and expert assessment of learning media for discovery learning based learning videos on the material of the human respiratory system fifth grade SD No.1 Mengwi obtained a score of 280.08 with percentage 93.36 % (very good). Based on the results of the validation assessment of each expert, the media developed products in learning the human respiratory system are clear, feasible, interesting, and right on target.

After carrying out the validation with the validator, for the next step, the researcher uses discovery learning-based learning videos during the learning process. To find out the quality/feasibility of the product used. The researcher did an individual test, namely by giving this product to 3 students who had low, medium, and high abilities in fifth grade at SD No.1 Mengwi. By implementing the health protocol, namely 3M (memakai masker (wearing masks), mencuci tangan (washing hands), dan menjaga jarak (keeping your distance)). This

study was unable to bring a product effectiveness test because of the situation and field conditions that were not possible due to the COVID 19 pandemic.

Overall, it can be concluded that the findings of the Discovery Learning-based learning video material for the fifth-grade human respiratory system SD No 1 Mengwi are suitable for use in the implementation of learning at home and school because it has the advantage of using the Discovery Learning learning model. Where students actively seek and explore the material in the learning video and the learning video findings include games that can widen students' memory. This is in line with research conducted by (Melinda & Degeng, 2017) Pengembangan Media Video Pembelajaran IPS Berbasis Virtual Field Trip (Vft) Pada Kelas V SDNU Kraton Kencong concluded that the developed product was suitable for use because it gave a positive response from students. This statement is also in line with the research done by [9] in research on the Pengembangan Video Pembelajaran Animasi Sistem Pernapasan Manusia Sebagai Upaya Mendukung Kebijakan Belajar di Rumah validation results and learning achievement tests for the development of this animated learning video media fulfill the valid criteria and suitable for use in the learning process at home. Besides, the use of Human Respiratory System animation learning video media can have a positive impact on learning activities at home because this learning video is related to the daily life of students and helps students understand the material.

4. CONCLUSION

The results and discussion related to development research concluded that the research product of learning video development based on Discovery Learning on science content using the 4D model is divided into 4 stages, namely Define, Design, Development, Disseminate, so a learning video media product is suitable for use in learning. Based on reviews and assessments by subject content experts with a percentage of 92.30% is qualified very well. Assessment by learning design experts with a score of 88.80% is qualified very well. Assessment by instructional media experts with a score of 92.30% with very good qualifications. And the last trial is an individual trial with the subject of 3 students with a score of 93.36% with very good qualifications.

Through the data collection method in the form of a questionnaire along with the interview and observation method, the validation results from experts and students were obtained. So based on this, the learning media based on discovery learning material of the human respiratory system in fifth grade at SD No 1 Mengwi is declared suitable for use in the online and offline learning process. With the discovery of learning media based on discovery learning material for the fifth-grade human respiratory system in elementary schools, it is hoped that it can add

more knowledge about the human respiratory system easily and meaningfully.

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