Development of Animation Video Media in Science Subjects for Class VIII SMP

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Article Info	Abstract
	The development of Animation Videos in the Science Subject for 8th Grade at SMPN 20 Padang is motivated by the fact that teachers have not yet used appropriate learning media in the teaching process, students are passive and less participative in the learning process, resulting in low learning outcomes. This research aims to produce valid and practical animated video products that can be used in the learning process. The type of research used is research and development or Research and Development (R&D). The development model used in this study is the 4D model. The 4D model consists of 4 stages: define, design, develop, and disseminate. The product validity test was validated by three validators, consisting of one content validator, namely the science subject teacher for Class VIII at SMPN 20 Padang, and two media validators, namely lecturers from the Department of Curriculum and Educational Technology at Universitas Negeri Padang. The practicality test of the product was conducted with students of class VIII.4 at SMPN 20 Padang. The results of the development of this animation video were obtained through validity and practicality tests. The validity test by subject matter experts yielded an average score of 4.6 with the category "very valid," and media experts from validators 1 and 2 obtained an average score of 4.93 with the category "very valid." Meanwhile, the practicality test results yielded an average score of 4.49 with the category "very practical." Thus, it can be concluded that the developed animation video can be used as a learning medium for the Science subject in Grade VIII of Junior High School.

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1. INTRODUCTION

Learning consists of several components, namely: students, teachers, materials, curriculum and media. Students are anyone who receives influence from a person or group of people who carry out educational activities (Dolong, 2016). Students occupy a position in the learning process.

According to Pendy et al (2022), learning is effective if there is a link between objectives and learning outcomes. Completeness of learning outcomes shows the achievement of planned learning objectives so that learning is said to be effective. The level of achievement of a lesson is a measure that students must achieve in learning. Achieving learning goals can take the form of increasing knowledge, skills and abilities. Knowing the effectiveness of learning is important because it will provide an idea of the extent to which learning can achieve its goals.

In line with today's educational needs, educational technology allows the development of learning media that suits learning needs. Media functions to connect information from one party to another. Meanwhile, in the world of education, the word media is called learning media. Learning media is anything that can be used to convey messages or

information in the teaching and learning process so that it can stimulate students' attention and interest in learning.

The use of learning resources in the teaching and learning process has currently been influenced by a shift in the learning paradigm from conventional to one that is more open and easily accessible. The flow of globalization requires the world of education to always adapt to technological developments as an effort to improve the quality of education. This paradigm shift can be seen from the ease in finding learning resources and increasing the role of media in learning activities (Budiman, 2017). The implementation of learning today needs to be supported by technology-based learning resources because it can make students adapt to current developments in the field of technology. Students who are accustomed to using technology-based media indirectly develop students' abilities and develop the quality of human resources (Hendri, 2019).

One of the subjects in junior high school is science. Natural science subjects are knowledge about the physical world whose impact does not only change the environment, but also changes human views and approaches to problems faced in everyday life (Hifni, 2015: 10). Science subjects emphasize direct experience to develop students' competencies. Apart from that, science learning is expected to help students gain a deep understanding of the natural surroundings by finding out and doing things independently.

Based on the results of observations and interviews conducted at SMPN 20 Padang on August 13 2024 in class VIII, researchers observed that teachers had not used appropriate learning media in the learning process. The media used include whiteboards, printed books and worksheets. Teachers dominate learning activities, while students tend to be passive (not active) and do not remember the material when taking part in science lessons. After just a few minutes the teacher explained the lesson, the students were already talking to their classmates on the grounds that they were bored and feeling sleepy because they only listened and took notes which made the lesson less effective. So not all students can understand the learning process just by listening to lectures from teachers and incomplete handbooks as a result of which students become passive and participate less in the learning process. Students' passivity is also seen in providing responses or questions to what the teacher has taught. In selecting learning media, educators should be able to choose media that is interesting and appropriate to the subject matter so that it meets expectations. Therefore, animated videos are the right medium to convey this learning material because they can explain in detail and in detail the material related to the human circulatory system.

Many types of learning media can be developed for use in the learning process. One of them is learning media in the form of animated videos. This animated video media certainly makes it easy to apply as media in the learning process. The advantage of animated video media in learning is that apart from being practical in use, of course it is also more innovative, choosing the style/animation that will be used in the video will bring more life to the material to be studied. So, with this, students will certainly understand the material being studied better.

One way that teachers can support the achievement of learning objectives is by designing video learning media. Therefore, teachers are required to be creative and innovative in developing learning media. It is hoped that the animated video media developed can create an interesting and conducive learning atmosphere.

According to Arsyad (2014: 218), a video is a series of moving images accompanied by sound which forms a unity that is strung together into a plot, with messages in it to achieve learning objectives. The benefits of animated video media in learning can make

the learning process more interesting so that it can stimulate students' motivation to learn.

Learning media development can be done individually *offline* or *online* without having to buy *software* like *Google Drive presentations, Keynote, Sparkol Videoscribe, Prezi, Mediashout, and Google Docs*. However, researchers are more interested in developing learning media using applications *Powtoon.. Powtoon* is an application-based program *web online* functions as a video creation application for presentations and creating learning media. According to Anita (2016:58), *Powtoon* is an application-based *web* which is online in the form of animated videos which can facilitate students' full understanding of the learning and teaching process, so they can receive and understand the material that has been designed by the teacher. Sudrajat (2010:11), also said that *Powtoon* is a combination of other media elements such as text, images, graphics, audio and video so that it can accommodate the learning styles of students who may have visual, auditory or kinesthetic learning styles. If used in learning, animated videos can overcome students' boredom. To overcome this, teachers can develop learning models by utilizing learning media using applications *Powtoon* as a learning aid (Deliviana, 2017:2).

Use of application-based learning media *Powtoon* has advantages including being able to choose learning freely, easy control in the learning process, interactive feedback available, many animation options available, presentation of material in language that is easy to understand, and more varied and practical use. Researchers are interested in using this application because it is easy for anyone to use and there are many animation options so it is not too difficult to use, so it can produce interesting learning media according to what is needed and desired according to the problems found.

Based on the explanation above, researchers are interested in developing learning media in the form of animated videos using the Powtoon application. Apart from that, the researcher is interested in conducting research with the title "Development of Animation Video Media in Science Subjects for CLASS VIII SMP".

2. METHOD

The type of research used in this research process is research and development *(Research and Development or R&D)*. Research and Development (R&D) is research used to produce certain products, and test the effectiveness of these products. According to Borg and Gall (2015), *Research and Development (R&D)* Basically it is a process used to develop and validate the product being developed. Based on this opinion, there is a process of developing and testing the feasibility and effectiveness of a product with criteria that are appropriate to the product produced. So, it can be concluded that the resulting product can develop a more effective and efficient method. In this study, researchers used a 4-D development model (four-D model) developed by S. Thiagarajan. This model consists of 4 development stages including Define, Design, Develop, Disseminate. Researchers chose this 4D learning model because the stages used are interrelated and systematic and simple compared to other design models. Apart from that, this model is structured as a program with systematic sequences of activities in an effort to solve learning problems in accordance with the needs and characteristics of students.

Data collection for this research was carried out by means of a response questionnaire from validity and practicality tests. The data analysis used is an analysis of student validity and practicality. The test subjects in this research were class VIII.4 students at SMPN 20 Padang. Trials are carried out to obtain data that will be used as a basis for determining the feasibility of the product being developed. The type of data produced by this research

consists of 2 types, namely quantitative and qualitative which comes from the results of product validation. Quantitative data is data in the form of numbers, while qualitative data is not in the form of numbers. Quantitative data was obtained through filling out questionnaires conducted on product validation and practicality. Meanwhile, qualitative data was obtained through interviews, suggestions and input provided by validators. The data analysis technique used is descriptive analysis which describes the validity and practicality of the media used, namely: 1) Validity Analysis, the data analysis technique used in this research is calculating the average score obtained from the results of data collection. This technique is used to determine the validity of media that has been developed based on assessments by media experts and material experts. 2) Practicality Analysis, the practicality of the media is obtained from the results of the student response questionnaire. The questionnaire uses a Likert scale with 5 categories, namely very practical, practical, quite practical, less practical and very less practical.

Next, the average score for each statement item is calculated, then converted into a value on a scale of five using the following formula:

$$\bar{X} = \frac{\sum x}{n}$$

Information: $\bar{X}$ = Skor rata-rata

$\sum x$ = Jumlah nilai

n = Jumlah responden

After the validity and practicality values are obtained, they are then categorized according to the level of validity and practicality as shown in the following table. The average score data is then converted into quantitative data with the scale shown in the table below:

Table 1. Student Response Questionnaire Criteria

Score Range	Category
$x > 4{,}20$	Very Valid/ Very Practical
$3{,}40 < x \leq 4{,}20$	Valid/ Practical
$2{,}60 < x \geq 3{,}40$	Quite Valid/ Quite Practical
$1{,}80 < x \leq 2{,}60$	Invalid/ Impractical
$x \leq 1{,}80$	Very Invalid/ Very Impractical

(Source: Eko Putro Widoyoko (2009))

This learning medium can be said to be practical, if the score range for all students in the student response questionnaire category exceeds 3.40.

3. RESULTS AND DISCUSSION

This research was carried out at SMPN 20 Padang, which aims to produce learning media in the form of animated videos in the science subject, Blood Circulation in Humans, Class VIII of SMP. The procedures carried out in this development research use the 4D development model. The 4D development model has four stages namely *define, design, develop*, and *disseminate*.

Level *Define* (Definition)

This definition stage is carried out by analyzing several aspects, namely:

1. Preliminary analysis

Based on the results of observations and interviews conducted at SMPN 20 Padang on August 13 2024 in class VIII, researchers observed that teachers had not used appropriate learning media in the learning process. The media used include whiteboards, printed books and worksheets. Teachers dominate learning activities, while students tend to be passive (not active) and do not remember the material. After just a few minutes the teacher explained the lesson, the students were already talking to their classmates on the grounds that they were bored and feeling sleepy because they only listened and took notes which made the lesson less effective. This causes low student learning outcomes as evidenced by the test results of class VIII students at SMPN 20 Padang.

Class	Number of Students	Average value
VIII.3	28 people	68,94
VIII.4	31 people	66,51

2. Curriculum analysis

The curriculum that will be used at SMPN 20 Padang is the independent curriculum. Analysis is carried out by examining learning outcomes (CP), learning objective flow (ATP), and teaching modules to determine the material that will be presented in the animated video. The material presented in the animated video is the human circulatory system.

The science learning objectives contained in the animated video are: 1) Students will classify the parts of blood and their characteristics and functions, 2) Students will explain the mechanism of the human circulatory system, 3) Students will understand the working mechanism of the blood clotting process, 4) Students will understand the working mechanism of the blood clotting process. Students describe the human circulatory system and its relationship to human circulatory disorders.

3. Learner analysis

This analysis step is carried out to determine the characteristics of students such as students' interests and learning styles as well as difficulties in learning both individually and in groups. Based on the results of observations and interviews that researchers have conducted; it can be concluded that the characteristics of students at SMPN 20 Padang have a less active response. Some are not enthusiastic about participating in the learning process. The student does not focus on the material presented by the teacher.

Level *Design* (design)

Based on the problems that occur in the field, at this stage the researcher begins to determine the right solution for the product outlined in the planning. Goal of the stage *design is* to design an animated video media that can help the learning process. At this stage, researchers prepare a storyboard which aims to explain the flow of the video from start to finish.

Level *Develop* (Development)

Goal of the stage *development* is to produce learning tools that have been revised based on experts. The learning media that has been created will go through the following stages:

a. Designing animated video media based on the human circulatory system.

   1) Create an account *Powtoon*

2) Create a worksheet on *Powtoon*
3) Input audio narrator
4) Collect assets related to material
5) Enter assets into the worksheet *Powtoon*, and sync with audio
6) Provide animation to assets to become animated videos
7) Do *finishing* video on *Adobe Premiere Pro*, so that it can be given *sound effect*, *background sound* and the video becomes interesting.
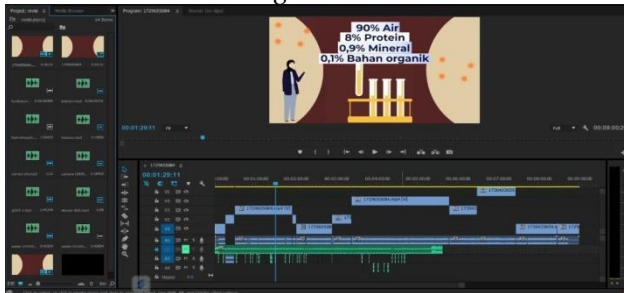
Figure 1. *Finishing* Video

b. Validation test

The validation test aims to obtain data to determine whether a product is valid or not using certain criteria. Product design validity testing is carried out by media experts and material experts. The assessment from the validator is obtained in the form of a questionnaire score which is used to assess the validity of the media that has been designed. The results of validation are in the form of suggestions, comments and input which will be useful in improving the learning media created.

Consists of 2 stages, namely material validation and media validation. This was carried out by 3 validators, consisting of 1 material validator, namely the class VIII science subject teacher at SMPN 20 Padang. Meanwhile, the media validator was carried out by 2 media validators, namely lecturers from the Department of Curriculum and Educational Technology, UNP.

Table 2. Validation Results

No	Validation	Assessment
1.	Material Validator	4,6
2.	Validator Media 1	4,93
3.	Validator Media 2	4,93
Information		**Very valid**

Based on the results of material and media validation that has been carried out, the Science Animation Video on Blood Circulation in Humans for Class VIII SMP as a whole is categorized as "very valid" and suitable for use for field trials.

c. Product trial

At this stage, field trials are carried out on students and teachers. This was done with the aim of finding out the practicality of the learning media being developed. After the trial is carried out, the next step is giving an assessment questionnaire to determine the response to the learning media that has been designed. The product practicality test was carried out with class VIII.4 students at SMPN 20 Padang.

Data on the results of the student practicality questionnaire are presented in the following table:

Table 3. Practicality Test Results

No	Aspect	Assessment
1	Appearance	4,42
2	Presentation of material	4,6
Rate-rate		**4,49**
Information		**Very Practical**

Based on the results of practicality tests by students in terms of appearance and presentation of the material. An average of 4.49 was obtained with the criterion "very practical". Based on this assessment, the animated video developed is practical for use in the learning process.

Level *Disseminate* (Deployment)

The disseminate stage is the stage for spreading the results of development. At this stage the researcher distributed the animated video to science teachers in class VIII junior high schools at other schools, namely at SMPN 4 Padang and SMPN 6 Padang.

4. CONCLUSION

The conclusions obtained are based on discussion data regarding Animation Video Media in the science subject material on the Human Circulatory System for Class VIII SMP, namely: 1) Validity test results by material experts obtained an average score of 4.6 in the "very valid" category. Meanwhile, media experts from validator 1 obtained an average score of 4.93 in the "very valid" category, and validator 2 obtained an average score of 4.93 in the "very valid" category. So, it can be concluded that the animated video product developed based on the scores given by the validator is overall declared "Very valid". 2) The results of the practicality test of the Animation Video for Science Subjects on the Human Circulatory System for Class VIII SMP based on student responses obtained an average score of 4.49 in the "very practical" category. 3) Based on validity and practicality tests, it can be concluded that the animated video developed is suitable for use as a learning medium in the science subject Human Circulatory System Material for Class VIII SMP.

5. SUGGESTION

It is hoped that the animated video product developed in this research can be used as an alternative for learning media and this development research is still limited to science subjects on the human circulatory system, therefore it is hoped that there will be further product development by future researchers.

6. ACKNOWLEDGEMEN

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