

Development of Motion Graphic Animation Video in Elementary School

Eko Wahyu Pricahyo
Sebelas Maret University
Surakarta, Indonesia

Muhammad Akhyar
Sebelas Maret University
Surakarta, Indonesia

Suharno
Sebelas Maret University
Surakarta, Indonesia

Abstract—This study aims to develop a learning media product in the form of a motion graphics animated video for elementary school students in Sukoharjo. This research uses the Research and Development (R&D) research type. The media development model used is the ASSURE development model. Research subjects involved in this research are teachers and 5th-grade elementary school students in Sukoharjo District. Data collection techniques used in this study are observation, documentation studies, and interviews. There are several research results that have been conducted. Firstly, based on preliminary study result, the teaching practice is done using the lecture method and simple props. Secondly, the current learning activities are still not effective and teacher-centred. Thirdly, student learning outcomes have not reached the Minimum Exhaustiveness Criteria (KKM). The last, a prototype of learning media in the form of a motion graphic animation video for elementary school students has been produced and been tested for media validation by media experts and subject matter experts, so is ready to be field-tested and implemented, with the aim of knowing the effectiveness of learning media that has been produced based on the preliminary study.

Keywords—video animation; learning outcome; elementary school; learning media

I. INTRODUCTION

Technology is progressing forward rapidly. Various everyday human activities can now take advantage of technology. Technology is present everywhere. Shopping, communicating, doing business and even entertainment can now be performed by technology. We live in a technologised society and we are placed in the situation of the technologisation of education [1].

The development of technology has an impact on education. The use of computers as part of technology is also increasingly widespread and has penetrated the world of education [2]. Education now has the freedom and alternative of using technology to deliver new things in classroom teaching. The ability of computers to manage information makes it an ideal tool for potentiating various implementations in the context of learning and learning [3]. Various technological benefits are supported by fast internet access, allowing teachers to access information and search for learning resources in order to become a medium of learning in the classroom.

Learning must now keep up with the progressive times. As Information and Communication Technologies (ICT) gradually

permeate daily life, they are profoundly changing the way education is conceived and delivered. [4]. Learning objectives are an important aspect of classroom learning activities. Thus, teachers should be able to master and utilize technology to be used in classroom learning.

This study aims to develop video-based learning media animation, namely motion graphics. In addition, also included is the matter of interactive exercises combined with motion graphics video, creating an interactive learning media package. The material contained in this video is tied to the daily life of the students. Thus, the resulting video is expected to be able to understand students well and student learning outcomes increase.

The focus of this study is to conduct a preliminary study of science teaching subject practice in primary 5th grade. The analysis conducted in this preliminary study is how the teaching practices are conducted by teachers in a science class 5 lesson. In addition, the analysis is done by finding information about the constraints that exist in current Natural Science (*Ilmu Pengetahuan Alam*) learning practices and learning outcomes that students achieve in following these lessons.

The innovation contained in this research includes how to create instructional media in accordance with the characteristics of students, interesting, but able to provide ease of understanding about the existing material in the video optimally for students. In addition, the material presented is repackaged by linking the students' daily lives lightly but still attaching importance to the core of the main material. Thus, this expectation can achieve the goal of student learning through improving student learning outcomes. In his research, George Matthew Naliveti said that “[...] the findings of the study suggest that using audio-visual as a teaching method stimulates thinking and improve learning environment in the classroom” [5]. Besides, Daryanto stated that video media is an effective medium to help the learning process, for mass learning, individually or in groups [6].

The definition of a learning video is a media that presents audio and visual which contains good learning messages that contain concepts, principles, procedures, knowledge application theory to help to understand of a learning material [7]. In addition, another definition of the video is explained by Smaldino, that the term of video refers to the electronic storage of moving images (videotapes, DVD, etc.) [8]. Video learning

is used as a media tool to help teachers in explaining learning materials to facilitate students to understand the material provided.

Choosing a learning video depends not only on the quality of the video to be presented; there is also a need for careful consideration of the video that will be given. If instructional media and technology are to be used effectively, there must be a match between the characteristics of the learner and the content of the methods, media and materials [8].

Selection of appropriate media will provide the optimal impact in the utilization of media used. The video used should match the characteristics of the students. Therefore, students become easier to understand the material presented by using video media.

In the utilization, video media can now be broadcast with various electronic devices, such as a VCD and DVD player, computer, or even a smartphone. Various video formats can now be read by electronic devices. Thus, the compatibility of the video media can be said to be flexible. In addition, the process of moving video files from one device to another is easier. Improved possibilities for sharing have further contributed to the rising popularity of videos [9].

II. RESEARCH METHOD

This research uses the Research & Development (R&D) research approach adopted from research model of Borg & Gall development [10]. Furthermore, it utilises the media development model using the ASSURE media development model [8]. The ASSURE development model was developed by Smaldino. This model is one of the development models used in developing a learning media.

The initial stage of conducting this research consisted of conducting preliminary studies. This preliminary study was conducted by seeking information on current Natural Science (*Ilmu Pengetahuan Alam*) learning. Methods of data collection are done by interview and observation method by collecting Learning Practice Plan (*Rencana Praktik Pembelajaran*) of the teacher. In addition, observations are made of current student learning outcomes by following existing learning practices. Another observation is to find information about facilities and infrastructure in the school, which is a modern technology provided in the utilization of learning.

The next step is to select the appropriate learning media. This is based on a preliminary study of learning materials, characteristics students, and facilities available in the classroom. The media selection step is discussed jointly by the teacher concerned. This is done because the teacher concerned has to experience and understand the material and characteristics of students in the classroom.

Furthermore, one of the important stages of this research is to develop learning media. The development of this media is based on preliminary studies and discussions with teachers on appropriate instructional media used in science subjects Class 5 Primary School. This development is done using the ASSURE media development model.

Once the product has been developed, the product can be called a media prototype. This media prototype can't be utilized in learning. Validation is required by media experts and subject matter experts. It aims to determine whether the media prototype that has been developed feasible to be utilized in learning. There are several aspects to be assessed in the validation of media experts and subject matter experts.

TABLE I. FIVE CRITERIA FOR EACH VALIDATION OF THE PROTOTYPE ASSESSMENT

Validation	Criteria
Media	Media Purpose
	Quality of Content
	Visual
	Language
	User Friendly
Subject Matter	Subject Matter
	Language
	Presentation
	User Friendly
	Visual

Table 1. There are five criteria for each validation of the prototype assessment. Each of the criteria contains questions relating to the criteria. Questions are made specifically and clearly, in accordance with aspects that have been made.

TABLE II. FIVE ANSWER SCORING OPTIONS USED ON A LIKERT SCALE.

Value	Qualification	Score
5	Very Good	A
4	Good	B
3	Enough	C
2	Less	D
1	Very Less	E

*Media Assessment Category

Furthermore, after obtaining the assessment results from media experts and material experts, the total score of both validations is then calculated to determine the feasibility of media prototype made. Media prototype feasibility analysis is calculated using the formula:

$$\text{Percentage : } \frac{\text{Total Score}}{\text{Maximum Score}} \times 100 \%$$

After producing the final result in the form of a percentage, the result of the count is then matched against the criteria of the feasibility of the entire media prototype.

TABLE III. MEDIA FEASIBILITY CRITERIA USED TO DETERMINE WHETHER THE MEDIA PROTOTYPE DEVELOPED IS FEASIBLE OR NOT TO BE USED IN LEARNING.

Level of Achievement	Qualification	Score
90% - 100 %	Very Good	A
75 % - 85 %	Good	B
65 % - 74 %	Enough	C
55 % - 64 %	Less	D
0 % - 54 %	Very Less	E

After going through the above stages, the development of learning media goes through the final stages. This is the learning media product that is final. This final product can be implemented in the elementary school.

III. RESULT

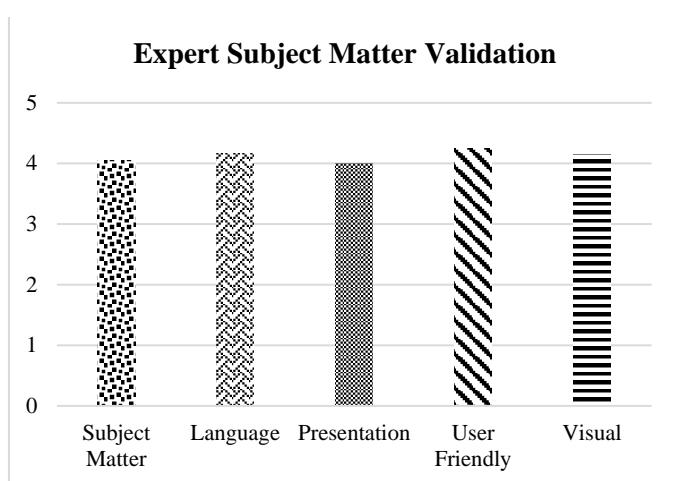
Based on preliminary studies that have been done, researchers found some research results. First, the method of learning done in schools is still that of talking actively. As a result, the learning process at school becomes teacher-centred. Students become passive. Second, the means of learning media tools are available in schools. Teachers have not yet used the instructional media tools available in schools optimally. Utilization of learning media tool is still rarely used. As a result, only 45% of students who score above the Minimum Exhaustiveness Criteria (KKM), i.e. 71. The rest, 55% of the students' scores, are not able to reach the Minimum Exhaustiveness Criteria (*Kriteria Ketuntasan Minimal*).

Based on preliminary study results conducted and discussions with the teachers concerned, the format of learning media selected is animated video. The animated video will be incorporated into CD storage combined with interactive exercise questions. The material used in the manufacture of video animation video prototype is the material of light properties. The animated video prototype contains two indicators about the material properties of light. The material is prepared according to the characteristics and level of student development.

The next stage is media development. The development of animated video media refers to 7 criteria, i.e. message clarity, stand-alone, easy to operate, material content representation, visualization with media, using high resolution and can be used classically or individually [7]. In developing the media, validating activities, both subject matter experts, and media experts become an important stage in assessing a media prototype to be tested. This is done to assess whether media prototypes developed are appropriate for use in classroom learning. Validation from subject matter experts aims to find out whether the developed media has been in accordance with the subject matter that will be taught by the students, both in terms of the quality of the subject matter presented and the cognitive level of the students.

Based on the validation of the material expert on the animated video media developed, the results of the assessment

can be seen in Figure 1.



*Result of Subject Matter Validation

Fig. 1. Five aspects of the assessment in the validation of the material expert showing the same value, which is value 4.

The value presented in Figure 1 shows that each aspect of the assessment falls into the "Good" category. However, in the assessment, there are some notes, namely suggestions on improving media prototype in terms of subject matter lessons.

There are several suggestions given in the material validation assessment. The suggestions are: 1) lesson material made simpler, so students are not confused in understanding the concept; 2) the subject matter is tied to the daily life of the student to be easily understood; 3) there are some ambiguous languages; 4) the characters in the video are made like a real form. Notes in the form of suggestions provided by expert course material's validators become an important point in the improvement of video media in order to produce quality media.

Furthermore, after the assessment of each aspect of the validation of the lesson material is learned, the next step is to calculate the feasibility outcome in all aspects of the validation of the subject matter. Based on the results obtained in Figure 1, the media prototype feasibility result in the validation of the subject matter scored 82.4%. The results show the validation of the subject matter that has been done into the "Good" category.

The next stage is the validation of media experts. Validation of media experts aims to determine the extent to which the quality of the media being developed. The results of media expert validation determine whether the developed media has been declared feasible and can be continued to be utilized in the lesson.

Based on the media assessment conducted by expert validators in the field of media, the results of the validation of media experts can be seen in Figure 2.

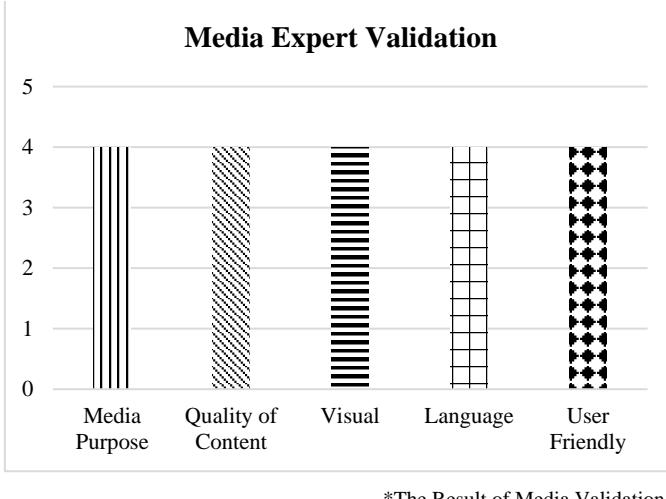
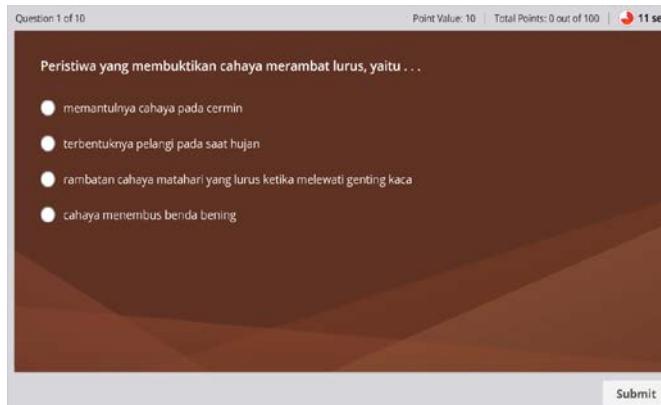


Fig. 2. Five aspects assessed in media validation get the score of 4 in all aspects.

Based on the validation results in Figure 2, it shows that the prototype is included in the "Good" category. The conclusion in the assessment is that the prototype made is considered feasible for use in learning.

However, from the results of the media validation conducted, there are some suggestions that become material for the perfection of the media prototype. Some of the suggestions have been given, one of which is the need to add skip options in the interactive question menu.



*Multiple Choice Question Menu

Fig. 3. The addition of the "skip" option aims as an option if media users want to bypass the menu question / resolve the wrong menu to be able to return to the main menu without having to answer the question first. Therefore, the user can reduce the time if they do not want to answer the question at that time.



Fig. 4. Expert media validator suggests providing profile menu in the main menu

The profile menu is useful for knowing who creates or develops a medium, so users who want to use/create similar media can communicate with developers. In addition, the profile menu is also used as a promotion for developers to introduce media results that have been created for the users.

Furthermore, in the media prototype, there is still a writing error. There are 4 writing errors contained in the developed media prototype. One of them is shown in Figure 5. This is of particular concern to developers, as the developed medium is addressed to elementary school students.

Words or sentences in the media are useful for providing information or additional information from the displayed image or animation.

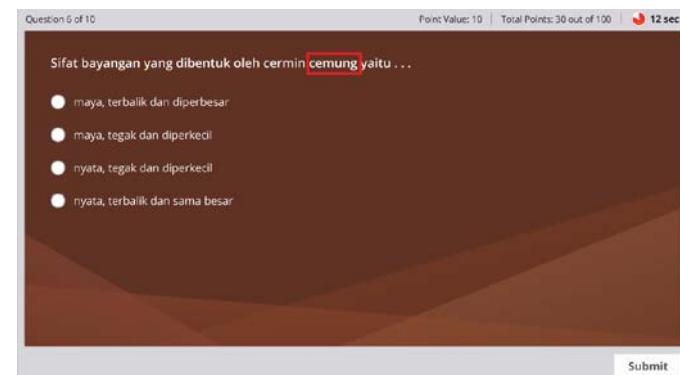


Fig. 5. Some writing errors in the developed media prototype. The writing error in the media developed is in this picture; one of them is in the interactive question menu.

For students who have difficulties understanding the images or animations that are displayed, in addition to listening to the audio narration that contains the explanation, they can also understand it through the words or sentences that are displayed. Thus, the accuracy of words and the use of simple and unambiguous words are important factors in media preparation.

Based on the results obtained in Figure 2, the media prototype feasibility results in media validation scored 80%. In conclusion, a prototype that has been validated by a media expert gets the "Good" category.

IV. RESULT

Based on the research that has been done, and the results obtained in this study, it can be concluded as follows. Preliminary study results have been found, to find some research data. First, the method of learning conducted in schools is still using the lecture method. As a result, the learning process at school becomes teacher-centred. Students become passive because they didn't explore the subject matter itself. Secondly, the means of learning media tools are available in schools. Teachers have not yet used the instructional media tools available in schools optimally. Utilization of a learning media tool is still rarely used. As a result, only 45% of students score above the Minimum Exhaustiveness Criteria (*Kriteria Ketuntasan Minimal*), i.e. 71. Then, 55% of the students' scores are not able to reach the Minimum Exhaustiveness Criteria (*Kriteria Ketuntasan Minimal*). Last, prototype media animation motion graphics video developed has been tested by experts' validation, which are subject matter experts and media experts. Based on the results of both validations, it can be concluded that the developed media prototype gets the category "Good" and is feasible and can be used in a field trial process, although there are some suggestions for fixing the media prototype so that later can produce better and more qualified media can be produced.

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