

THE DEVELOPMENT OF ANIMATION VIDEO-BASED LEARNING MEDIA ON THE POLYHEDRON MATERIAL ASSISTED BY POWTOON SOFTWARE

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ABSTRACT

This research aims to; 1) know the feasibility of learning mathematics media on flat-sided building materials based on animated videos on flat-sided space-building materials; 2) know students' responses to the use of mathematics learning media in polyhedron materials based on animated videos assisted by Powtoon software, 3) know students' responses to the use of mathematics learning media in polyhedron materials based on animated videos assisted by Powtoon software. This study used the Research and Development (R & D) method according to Borg and Gall. The research subjects involved were one media expert, one material expert, a mathematics study teacher, and seventh-grade students at MTs Al-Washliyah Tebing Tinggi. The experts gave an assessment of the feasibility of the product developed by the researcher, while the students and teachers responded about the attractiveness of the product developed. The results of this study were 1) The product produced was categorized as very feasible based on validation from material experts with a presentation of 92% and media experts with a presentation of 82%. 2) Powtoon was very interesting to be used as teaching material based on the teacher's assessment getting a presentation of 81%, and student responses to field trials getting a percentage of 89%.

1. INTRODUCTION

Technological developments change the teacher's task from a teacher in charge of delivering subject matter to a facilitator who provides convenience in learning. The rapid development of technology raises questions about the teacher's task as a teacher whether it is still necessary for teachers to teach in front of the class alone, write material on the blackboard, and then assign students to copy it, and so on. For this reason, teachers must always develop their potential professionally in accordance with current technological developments therefore the teacher's task as a teacher is still needed.

According to Barnawi (2012), the use of technology in schools is something that must be done by teachers. Teachers can use technology as a medium of learning. This technology can make it easier for teachers to describe or illustrate the material being studied. This will clarify things between theory and practice so that students are able to see the real thing. In addition, teachers can also use learning media related to technology to expand and deepen knowledge for themselves and their students. The Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 81A of 2013 states that the principle of developing a learning implementation plan in the 2013 Curriculum must apply technology, information, and communication in the learning process. For this reason, teachers are required to be able to use technology well.

The rapid development of technology is currently based on the development of mathematics in various fields. Mathematics is one of the fields of study that supports the development of science and technology (Sundayana, 2013). Mathematics needs to be given to all students starting from elementary school to equip students with logical and critical thinking skills. As an educator, the teacher must be able to improve the ability to master the technology so that they are able to provide mathematics lessons that are in accordance with current needs.

2. METODHOLOGY

The method of this research was Research and Development (R & D) according to Borg and Gall. The research subjects involved were one media expert, one material expert, a mathematics study teacher, and seventh-grade students at MTs Al-Washliyah Tebing Tinggi. The experts gave an assessment of the feasibility of the product developed by the researcher, while the students and teachers responded about the attractiveness of the product developed.

3. RESULTS AND DISCUSSION

Based on observations made in class VIII of MTs Al Washliyah Tebing Tinggi, students' ability to understand mathematics is still low. The lack of use of learning media can be one of the factors for the low student understanding of mathematics. In addition, there are still many students who look less enthusiastic and are busy talking with their friends. They do not pay attention to the teacher when explaining the material being studied. This can have an impact on the low ability of students to understand concepts related to mathematics, even though mathematics lessons are very useful to be applied in everyday life where we will certainly do money transactions, count time, add up goods, and so on.

The next problem that the researchers found in the observations in class VIII of MTs Al Washliyah Tebing Tinggi was the use of power points by teachers who were not attracted to students. The learning carried out was less meaningful for students and tended to be teacher-centered. Teachers must be able to create effective and efficient mathematics learning by instilling concepts in students, therefore, students are able to understand and remember the material in the long term which it can make learning outcomes increase and there are no misconceptions about the material being studied.

According to Mulyasa (2016), learning should be involving as many students as possible so that they are able to explore form competencies by exploring various potentials. For this reason, teacher creativity is needed so that they are able to become facilitators and learning partners for students. Teacher creativity can be done by creating and developing learning media and other teaching aids that are useful for improving the quality of learning.

Learning media needs to be developed by utilizing technology that is supported by the availability of existing facilities in schools. Learning media in the form of video is one of the appropriate alternatives to be used in class VIII of MTs Al Washliyah Tebing Tinggi. There are facilities that support the use of video.

According to Munir (2015), one of the advantages of video is that it can enrich presentations or explanations effectively and efficiently. Teachers can use several applications that can be presented in the form of videos, including video scribe, PowToon, Animaker, and so on. Villar stated that PowToon is a web-based application provided for users to create animated videos by manipulating objects, importing images, and providing music and users can add sounds (Andrianti, 2016).

The use of PowToon animation learning media is based on previous research conducted by Asyifa (2018) which states that learning videos made with PowToon are feasible to use and can improve students' understanding of mathematical concepts. The differences between this study and previous studies are 1) the video duration is longer, which is approximately 13 minutes; 2) various animations are used to serve as illustrations related to everyday life, and 3) using sound recordings as support to clarify the material presented.

Based on these problems, the researchers conducted a study entitled "Development of Animation Video-Based Learning Media on the Polyhedron Material Assisted by Powtoon Software". The problem formulated based on the background above is "How is the process of developing PowToon animation learning media in the mathematics subject of polyhedron in class VIII?"

Table 1. Media Expert Validation Results

Assessment Aspects	Expert Media 1	
	Score	Percentage (%)
Appearance	11	80,00
Presentation	16	80,00
Effect	16	80,00
Total	41	82,00
Category	Very Feasible	

Based on Table 1, it can be concluded that the feasibility test by the first media expert and media expert obtained a percentage that was included in the very feasible category. The percentage of the validation results of the two media experts is in the range of $80 < NP \leq 100$ with a very feasible category therefore the PowToon animation media is suitable for use in learning mathematics in class VIII.

Material Expert

Material experts play a role in validating the media in terms of content and presentation of the material. The media feasibility test was carried out by media experts from Universitas Muhammadiyah Sumatera Utara. The following is an analysis of validation data from material experts.

Table 2. Material Expert Validation Results

Assessment Aspects	Material Expert	
	Score	Percentage(%)
Content	19	80.00
Presentation	27	100.00
Total	46	97.00
Category	Very Feasible	

Based on Table 2, it can be concluded that the feasibility test by the first material expert obtained a percentage that was included in the very feasible category. The percentage of the validation results of the two media experts is in the range of $80 < NP \leq 100$ with a very feasible category so that animation media is feasible to use.

Product Revision

After the validation stage was done, then the PowToon animation media was revised for its shortcomings based on comments and suggestions from experts. Experts commented that this video was good and could be used for field testing. There are several suggestions given by experts, including:

- 1) It is better to insert the voice in the exercise sample;
- 2) Add the engagement activities of students;
- 3) Add the indicators and learning objectives;
- 4) Extend the duration of exercise sample section; dan
- 5) Use an inductive approach.

Based on the comments and suggestions above, PowToon animation media needed to be revised even though it was feasible to use. The revisions that have been made to the development of this PowToon animation media are:

- 1) Inserted the voice in the exercise sample;
- 2) Added the student activities by adding the duration in the section of “tahukah kamu?” therefore students can be involved;
- 3) Added the indicators and learning objectives in 2 slides;
- 4) Extended the duration in the exercise sample section into 40 seconds; and
- 5) Used the inductive approach

Then the PowToon animation media was revised for its shortcomings based on comments and suggestions from experts. Experts commented that this video was good and could be used for field testing. There are several suggestions given by experts, including:

- 1) It is better to include the voice in the exercise sample;
- 2) Please adding the student engagement activities;
- 3) Add the indicators and learning objectives;
- 4) It is necessary to extend the duration especially in the exercise sample section; and
- 5) Use an inductive approach.

Based on the comments and suggestions above, PowToon animation media needs to be revised even though it is feasible to use. The revisions that have been made to the development of this PowToon animation media are:

- 1) Inserted the voice on each sample question;
- 2) Added student activities by adding duration to the question "do you know?" so that students can be involved;
- 3) Added indicators and learning objectives in two slides;
- 4) Extended the duration of the exercise sample from 20 seconds to 40 seconds; and
- 5) Already using an inductive approach to the formula for the perimeter of a square.

Practicality Test

PowToon animation learning media that has been validated and revised according to comments and suggestions from experts then tested its practicality through the teacher's response. The teacher's response plays a role in assessing the media from a technical point of view, presentation, and quality of the media. The teacher's response was carried out by the fourth-grade teacher at SDN Karangumaritis. The following is an analysis of the practicality assessment data from the teacher's response.

Based on Table 3, it can be concluded that the practicality test of the teacher's response obtained a percentage of 93.33% with a very practical category. The percentage of the teacher's response results is in the range of $80 < NP \leq 100$ with a very practical category therefore the PowToon animation media is practically used.

Student's Responses

Student responses play a role in assessing the media from a technical point of view, presentation, and quality of the media. Student responses were carried out by fourth-grade students at SDN Karangtumaritis with a total of 22 students. The following is an analysis of student response assessment data.

Tabele 4. Student's Responses Results

Assessment Aspects	Percentage (%)	Category
Technical	95,71	Very Good
Presentation	93,64	Very Good
Media Quality	94,09	Very Good
Total	94,73	Very Good

Based on Table 4, it can be concluded that the results of the student responses obtained a percentage of 94.73% with a very good category. The percentage of the student's response results was in the range of $80 < NP \leq 100$ with a very good category so that the PowToon animation media can make students interested in mathematics in class VIII.

Discussion

The media chosen in this development is PowToon animation learning media because PowToon provides more animation than other applications. The animation can also be arranged easily according to the user's wishes so that it is easy to use and provides an illustration related to the material to be presented. PowToon Animation is an application that has powerful features on one screen, which can create various animations as needed. In the study, it was also stated that animation has many advantages, such as being able to eliminate boredom in learning, arouse enthusiasm for learning, and of course, animation can attract students' attention to stay focused on the learning process (Hasbulah, 2018).

The development of PowToon animation learning media is packed with content that contains an illustration related to the material around rectangles, and triangles. The content is adjusted to the learning objectives to be achieved from the learning process by using this animated media in the form of video. Learning using video media is done so that the delivery of material can be more interesting and clear (Latif, 2013).

The success of developing PowToon animation learning media in mathematics in grade IV is proven through media validation by media experts and material experts, teacher and student responses, and students' understanding after using this learning media. The validation test that has been carried out by the first media expert in terms of appearance obtained a percentage of 90.77%, in terms of presentation it obtained a percentage of 80%, and in terms of effects obtained a percentage of 80%. The feasibility test by the first media expert obtained a percentage of 87% with a very feasible category.

The validation test that has been carried out by the second media expert in terms of appearance obtained a percentage of 100%, in terms of presentation it obtained a percentage of 93.33%, and in terms of effects, it obtained a percentage of 85%. The feasibility test by the second media expert obtained a percentage of 96% with a very feasible category.

In addition, the validation test that was carried out by the first material expert in terms of content obtained a percentage of 88.33%, and in terms of the presentation obtained a percentage of 87.5%. The feasibility test by the first material expert obtained a percentage of 88% in the very feasible category. Meanwhile, the validation test that has been carried out by the second material expert in terms of content obtained a percentage of 80% and in terms of presentation, it obtained a percentage of 87.5%. The feasibility test by the first material expert obtained a percentage of 83% with a very feasible category.

The validation of PowToon animation learning media by experts overall gets a percentage of 88% which is included in the very feasible category. The description shows that this learning media is very suitable to be used in the mathematics learning process on the material of polyhedron.

Based on the discussion of the results of the development of the PowToon animation learning media in the mathematics subject of polyhedron in class VIII, the media is considered to have been successfully

developed into a better media because it is feasible to use and has been packaged practically in accordance with the development stage and is able to provide the benefit for students to provide students with an understanding of the mathematics subject in polyhedron material.

4. CONCLUSION

Based on the results of the research and discussion, it can be concluded that the PowToon animation learning media using Gall & Borg which the researchers summarized into 7 steps has been developed based on the results of criticism and suggestions from experts so that it can be tested in class VIII MTS Al Washliyah Tebing Tinggi. Thus, PowToon animated learning media can provide students with an understanding of mathematics subjects in class VIII.

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