



Development of the powerpoint animation learning media on the heat topic

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ABSTRACT

During the Covid-19 Pandemic, teachers were be required to do online learning. Students have difficulty understanding the material provided in the online learning process, so this research aims to produce PowerPoint animation-based learning media and the effectiveness of using PowerPoint animation learning media. The research method used was Research & Development with the ADDIE research design. The research subjects consisted of 32 students of class XI MIPA 1 at SMA Negeri 1 Tanggul. From the validation provided by 2 media experts, validator and user validators (teachers), the PowerPoint animation media was declared incredibly valid with an average confirmation of 3,94. The effectiveness of PowerPoint animation media on student learning outcomes after using the PowerPoint animation learning media states that student learning outcomes increase. The increase in student learning outcomes (n-gain) was 70.69 using the average category of media effectiveness analysis. The study results stated that the PowerPoint animation learning media is feasible to apply in the learning process. Using PowerPoint animation learning media can improve student learning outcomes on heat material.

Keywords: PowerPoint animation, heat, media

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INTRODUCTION

A study of natural science that deals with phenomena or events in the surrounding environment are physics (Suwindra, Sujanem, & Suswandi, 2012). The study of physics requires a transparent process and concept to master the existing theory. The study of physics is one subject that students fear (Guido, 2013); it is supported from a Pathoni

opinion (2015), Herliandri (2018), and Kurniawati (2018), stating that students' fear is based on the student's experience during a physics class. Some students think that physics is a serious and complex subject because it relates to concepts and mathematical equations (Nordin & Ling, 2011).

At a covid-19 pandemic like this, learning sees the last of online so that teachers cannot detail the material given to students. The result

can make students experience difficulties in understanding the material that can cause students' learning results to be lower (Septantiningtyas, 2018). To requires a learning medium that a teacher can use to deliver heat materials. Learning media can increase motivation and encouragement to students in the learning process to influence students' psychological (I. A. D. Astuti & Bhakti, 2018). The use of virtual learning media can also enhance student science process skills in learning (Febrianti, Nuraini, Supriadi, & L.R, 2020). The learning media that can use to help students understand the physical material is by using PowerPoint. The advantage of PowerPoint in its presentation can be designed and combined with pictures, text, and sound, thereby attracting students (Daryanto, 2016). Developing this learning media is combined with sequential solid images that will produce animal-like motion pictures. Sound effects add accurate impressions to animation (Y. W. Astuti, Hidayat, & Auliandari, 2019). The developed learning media is interactive and can make learning effective and efficient (Sanaky, 2009). In development research, animation PowerPoint media is supported by previous studies that claim innovative PowerPoint animation learning media is worthy of being used as a material of physics (Y. W. Astuti et al., 2019). Using PowerPoint learning media can increase motivation, activation, and student learning results (Srimaya, 2017). Using animated PowerPoint learning media can complete students' learning results (Saputro & Kusnan, 2017).

The material to be discussed in the animat-ed PowerPoint learning media is heat. The selection of heat materials in the development of animated PowerPoint media is because they are abstract and require a clear conceptual understanding to master heat theory. The effect of this animated PowerPoint learning media is expected to improve students' learning results on heat materials. Thus, the purpose of this study is, among other things, to produce animal-based learning media PowerPoint and measure facilities for the use of animation PowerPoint learning media.

RESEARCH METHODS

The kind of research that is used is research and development. Research and development are used to produce new products or measure products (Sugiyono, 2012). The design /model of product development using Addie is composed of analysis (analysis), design (design), development (development), implementation (application), evaluation (application).

The research was done online in the school year 2021/2022 using Google classroom. Studies were carried out at SMA Negeri 1 Tanggul TO the XI MIPA Class 1, which consisted of 32 students. In this development research, 5 appropriate procedures are followed: (1) analysis, at this stage researchers analyze problems students face during the learning process, (2) design, design media to be made to meet heat's subject, (3) development, the development of media based on the design made earlier, (4) *Implementation*, testing PowerPoint animation media for a student to get adequate data, (5) *Evaluation*, analyzing obstacles during research.

The instrument used in research is the validating sheet given to two validator media experts and the user validator (teacher). The category used in this questionnaire sheet applies to the liquid scale of 1-5. To analyze the results of media validation can be stated by (Endang, 2013):

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

Description:

P = Score presentation (rounded up)

$\sum R$ = Total answer scores given by each responder

N = The ideal amount of torque in one item

From the analysis of media validation, validating criteria and can be seen in table 1.

Table 1. Media criteria Validity

Score V_a	Criteria
$3,25 < V_a \leq 4,00$	Very Valid
$2,50 < V_a \leq 3,25$	Valid
$1,75 < V_a \leq 2,50$	Less valid
$1,00 < V_a \leq 1,75$	Invalid

(Ratumanan & Laurens, 2011)

The second instrument used for the animation PowerPoint media facility is testing. The test consists of 5 descriptions in each of the pre-test and the post-test. *To learn the results of a student's study test, may use the following equations:*

$$\text{Score} = \frac{\text{Scores obtained}}{\text{Maximum score}} \times 100 \quad (2)$$

(Arifin, 2014)

As a result, the score obtained would be categorized by the average effectiveness of a medium such as a table 2.

Table 2. Media Facility Category

Dexterity	Information
81-100	Very Effective
61-80	Effective
41-60	Pretty Effective
21-40	Less Effective
0-20	Ineffective

(Riduwan, 2012)

The result of the student's study tests that have been calculated, the next step is to find the pre-test and post-test scores using the formula *N-Gain* by (Meltzer, 2002):

$$N\text{-Gain} = \frac{\text{Score posttes} - \text{Score pretest}}{\text{Score maks} - \text{Score pre test}} \times 100 \quad (3)$$

By (Meltzer, 2002) *N-gain* in normalization scores can be divided into several categories seen in Table 3.

Table 3. Acceptable Gain Criteria

Dexterity	Information
Percentage	Classification
$N\text{-Gain} > 70$	High
$30 \leq N\text{-Gain} \leq 70$	Medium
$N\text{-Gain} < 30$	Low

RESULTS AND DISCUSSION

Based on observations made at SMA Negeri 1 Tanggul, learning from the sophomores is still categorized as inferior, which is confirmed by students' study during the learning process. The Low of learning results because the teacher is unclear in the material, the limitations of the AIDS a teacher can use in the learning process, and the teachers are less creative at exploiting the learning media. And another factor affecting students' lack of learning is the student's mindset that suggests physics is profound, complex, and dull, adversely affecting students' learning. Coupled with the current covid-19 pandemic states, it also makes students confused about understanding any physical matter because of online learning. So out of the problem, researchers developed an animation PowerPoint learning medium to feature learning that can be easily understood and enjoyable.

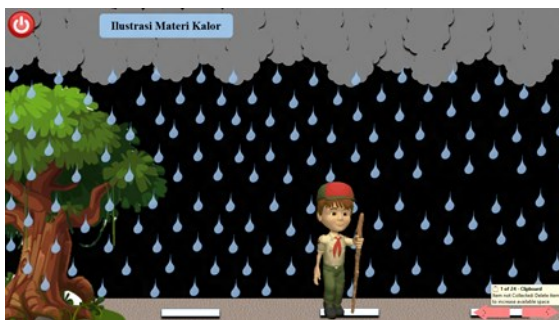
The theme developed in developing the animated PowerPoint learning media is about natural articles since the material discussed heat. The generated media of learning is interactive because research carried out during the pandemic requires online knowledge. The benefits of interactive learning media, to make it easier for students to access learning media, learning becomes more exciting and improves students' learning qualities. In addition to the interactive learning media, these learning media are also animated, attracting students' attention and motivating students in the learning process. The main display of animated PowerPoint media can be seen in picture 1.



Picture 1. The main display on PowerPoint animation media



Picture 2. Menu display on animated PowerPoint media



Picture 3. Animated matter display on animated PowerPoint media

There are 5 stages to develop a learning medium: (1) analysis; at this point, researchers observe a problem during the study of physics, where students tend to be passive during the learning process. It results from a student's lack of interest in a physics lesson that affects their learning. Researchers developed a physics learning medium that could keep students active during the learning process from these problems. (2) *Design*: At the design stage chosen for a theme in development, it is a natural theme because it corresponds to the subject matter, heat. Design consists of opening, filling, and closing. The opening of the loading page with the media design content consists of clues for media use, material profiles (ki and kd), materials discussed on heat, heat movement, and the principle of black. There is also a media training program for the problem and profile of the maker. The conclusion of the media contains exit page.

(3) *Development*, this is the stage of a learning media production with a design that has been made before. After the animated

PowerPoint learning media is created, the next step is to validate the learning media in order to know the worthiness of a learning media what validator animation study media is 2 validator experts and the user validator (teacher). Be based on results of the learning media that 2 professors of the media and the validator of the user (teacher) can be seen in table 3.

Table 3. Validating the entire validator

Validation Aspect	Validator	Validator	Validator
	1	2	3
Whole validation	4,15	3,31	4,37
Average	3,94	3,94	3,94

Based on table 3, validation data results in state that animation PowerPoint learning media is declared to be perfectly valid/ perfectly feasible to apply to learning. While animation learning media is well applied in the learning process, there is input given by the validator media expert to researchers. The developed media be revised to become a better and more worthy medium for application. As for Suggestions given by the validator (a) to add directions to the use of media to make it easier for the student to run the media, (b) to add the key back to the main page so that the student will not have to spend new material slides back to the front page, (c) to give information in the illustration so that misconception is not to be taken.

(4) *Implementation*, After the media has improved according to the suggestions given by the validator media experts and the user validator, the next step is testing the PowerPoint animation media for students SMA Negeri 1 Tanggul class XI MIPA 1, which is comprised of 32 student's. The first stage of research is to perform a pre-test of 5 problem descriptions to know the students' initial knowledge before using the animated PowerPoint learning media. After a preliminary test,

the next step is to give students a powerful animation learning medium developed for students to be studied and understood. After students have finished studying the material in the animated PowerPoint learning media, they enter at the final stage of the application, giving a post-test used to know the student's previous knowledge after using the PowerPoint animation learning media.

From the data, the pre-test scores and the student post-test results state differences in students' learning before and after students use the animated PowerPoint learning media. The difference in education is due to the online knowledge of the XI MIPA class 1 students using the KBM. KBM is electronic learning used by public high school 1 dikes to facilitate teacher/student interaction. In the next KBM, students can present and follow the online learning via the KBM website. One day before the teaching took place, and the teacher uploaded the materials on KBM, the student downloaded the material the teacher already uploaded on the KBM for study. During the survey using KBM, teachers give learning materials using PowerPoints consisting of text, formulas, and material examples only to make the material appear unattractive.

With unattractive material views, making learning boring and confusing students with understanding the material's content can thus impact students' learning results. But when learning USES the animated PowerPoint learning medium, students' learning results are better because the presentation of materials in lively PowerPoint media is best presented. In the playful PowerPoint learning media, there are several components: text, formula, pictures, sounds, and material illustrations drawn from the examples of everyday life. The animated PowerPoint learning media is also interactive where can start these media if students operate the media themselves. Students can use the press by clicking icons in the media. So with the animated PowerPoint medium being interactive can increase the student's learning motivation, which makes students easier to understand the material and make the student's learning results different from before. These differences in learning affect the

students' study results because they significantly change the pre-test and the post-test. The average score students score before using the PowerPoint animation learning medium is 41.69%, while after students use the PowerPoint animation learning medium, the average student score is 83.03%. Based on data obtained, animation PowerPoint learning media can virtually facilitate media use in the study of physics. From the score on average, animation PowerPoint learning media can so-called reducing because animation PowerPoint learning media displays interesting lesson materials and thus makes it easier for students to understand the material on the PowerPoint animation teaching media.

Students can easily understand the material in the animated PowerPoint learning medium because the lively PowerPoint learning media shows an illustration in daily life and then furnished with an explanation of the image by using a dubber/ voiceover to make learning fun. Examples explain using a dubber/ voiceover, but all of the materials in learning to described as utilizing a dubber/ voiceover to make animated PowerPoint teaching media enjoyable. If the resulting learning media is compelling, it can make students happy to follow learning, thus affecting their learning results.

The data obtained states that animation PowerPoint learning media can facilitate; this is consistent with studies by previous researchers who claim there is a significant impact on students' learning after using the PowerPoint animated learning medium (Rahman & Mahmud, 2018). Can otherwise facilitate animation PowerPoint media that students' learning results are better than those known before using the PowerPoint animation study media, as is evident from the average post-test results of 83.03 students receive ineffective categories. In addition to making students' learning results suitable, using this animated PowerPoint learning medium can also increase students' understanding of heat materials. It was consistent with the research (Y. W. Astuti et al., 2019), which states that PowerPoint can increase student understanding. (5) Evaluation: This study evaluates that can re-

store animation learning media at the design stage to be more helpful.

CONCLUSION

Based on the results of the analysis outlined in the discussion, and it can be concluded that the PowerPoint animation learning media that has been validated by the validator of media experts and the user validator are declared valid in the heat material physics learning process with a percentage of the variance of 78.89%. In addition, the use of the medium of animation PowerPoint studies in learning can improve the results of studying XI MIPA class 1 students with an excellent score of 83.03.

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