Interactive Power Point Implementation as a Digital Learning Media in Increase Understanding Theory Temperature and heat in students Elementary School

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Abstract. This study aims to analyze the application of interactive power point as a digital learning medium in increasing the understanding of temperature and heat theory in elementary school students. The study was conducted on 37 elementary school students in the city of Bandung using conventional teaching methods and demonstrations. We also use interactive power point media and Google Meet in the learning process. To determine the level of students' understanding of the material, researchers used evaluation techniques in the form of pre-test and post-test, each of which included as many as 20 questions through Google Form. The results showed that students got an average increase of 2.48 in learning outcomes. The increase shows that 68.92% of the material can be understood by students. This is because the learning process using conventional teaching methods, demonstrations, and interactive power point learning media can increase students' attention and focus, so they don't get bored while learning. Therefore, this study provides information that interactive power point media can be used as an interesting learning medium that can increase students' understanding of temperature and heat material.

Keywords: Digital Learning, Theory Temperature, Elementary School.

1. Introduction

Elementary school is the first step in formal education, so teachers will face various situations that can affect the success of the learning process [1]. Elementary school students have a high interest in everything that is dynamic, so the school environment must be able to facilitate students in developing cognitive, affective, and psychomotor aspects. Therefore, a teacher must be sensitive to the atmosphere and able to think critically and creatively in designing the learning process that will be carried out. According to Anisa et al. material and atmospheric factors greatly affect learning activities [2]. The atmosphere factor is influenced by teaching materials, media, methods, and others. Therefore, one of the ways teachers influence learning activities is through the use of learning media that can affect students' enthusiasm for learning.

According to Hamidjojo, learning media is media that can be used as an intermediary in conveying something so that it can be accepted and understood by students [3]. Meanwhile, according to Tafonao, learning media is something that is used to channel messages from the sender to the recipient, so that it can stimulate students' thoughts, concerns, feelings, and interests in learning [4]. Based on some of these opinions, it can be concluded that learning media are everything that teachers can use as intermediaries in conveying information to students so that they can stimulate students in carrying out learning activities.

Based on this, a teacher must be able to choose and determine the right learning medium so that all materials can be delivered within a predetermined time allocation. This is in line with Supriyono's opinion that the use of media in learning activities can shorten learning time as well as support the achievement of learning objectives [2]. In addition, the learning media used must be packaged creatively, so that teachers can create a pleasant learning atmosphere and students do not feel bored while studying.

Technology and information are increasingly experiencing rapid development. The presence of technology has an impact on all aspects of life, one of which is the world of education. Technological developments in the midst of the industrial revolution 4.0 require teachers to continue to make updates in their teaching and learning activities. Until now, the world of education has been required to undergo a lot of transformation through the application of learning media digitally based [5]. According to Eueung, digital-based learning media can be an alternative to be able to develop learning techniques and attract students' attention [6]. Therefore, the Ministry of Education and Culture is currently intensively conducting socialization about the development of digital-based learning in Indonesia so that Indonesia can produce human resources who are able to compete in the global era.

In addition, the presence of the COVID-19 pandemic has forced the government to establish policies for the implementation of online learning in the field of education. Online learning is learning that can apply interactive learning models to the internet based on [7]. On the other hand, the presence of the COVID-19 pandemic has a positive impact because it further encourages the implementation of school digitization. The COVID-19 pandemic requires teaching and learning activities to be carried out online to break the chain of spread of the COVID-19 virus. This resulted in many teachers experiencing culture shock. Therefore, teachers should be able to adapt to optimizing technology as a learning medium as well as conduct online learning.

One of the digital-based learning media that can be used by teachers in online learning is power point. However, the use of power point as a learning medium has not been maximized because teachers are still completely dependent on the books they have. Power point is a medium that can be used to convey theory in the form of text, sound, images, animated videos, and so on, so that students can learn effectively and achieve learning objectives [8]. Meanwhile, according to Kudsiyah, interactive power points are power points that can not only provide convenience in conveying theory but are also made to increase student participation in learning [3]. The use of interactive media seeks to improve the learning process and make it more effective and functional [9]. Power points have many features that can be used to attract students' interest in learning, so interactive power points can be a teacher's solution to overcome the delivery of material that is considered difficult.

Science is one of the subjects that many consider difficult for students. In addition, many research results state that in addition to being difficult, science becomes a boring lesson [10]. Another fact states that the achievement of learning science by the Indonesian people is still

low. This can be seen from the results of the 2018 PISA (Program for International Student Assessment) report, which stated that Indonesia's science score was ranked 70 out of 78 participating countries. Based on the results of an interview with one of the school teachers, no students have been able to achieve 100 on the school examination (US) and national examination (UN) in science because of the low understanding of concepts in each science material, so students have not been able to explain the material, provide examples, and conclude what they have learned.

Based on this description, learning media has great potential to increase students' understanding of the material being studied. Therefore, a teacher must be competent in using media in learning activities [11]. Interactive power point learning media is the simplest digital-based media that can be easily used by teachers at various ages. Interactive power point learning media can be an effective medium if the teacher can make maximum use of it.

The results of research conducted by Soimah showed that the power point learning media had an effect on student learning outcomes in science subjects, as indicated by an increase in learning outcomes of 4.48 [12]. The drawback to this research is that the pre-test data is taken from the students' mid-semester exam scores, so it is deemed insufficient to show the actual situation that occurred at the time the learning was carried out. Other studies say that the use of power points can attract attention and increase student motivation in learning, so students can easily understand the material of human and animal respiratory organs [8]. The weakness in this study is that there is no use of pre-test and post-test in evaluating students' understanding of the material.

Furthermore, based on the results of Nursyaidah et al. research, it can be concluded that the use of power point media has a positive influence on social studies learning outcomes for fifth grade elementary school students because the average final test result is in the "Very High" category [13]. The same thing with the study that next states that interactive power point-based learning media are suitable for use in the online learning process with very good qualifications [14]. The disadvantage of this learning is that there is no pre-test, so it is not known whether student learning outcomes have increased or not. Other results say that power point media is effective in improving the understanding of science material for fifth grade elementary school students, as evidenced by an increase in test results of 0.66 in trial 1 and 0.67 in trial 2 [2]. The weakness in this study is the small number of respondents, so the results are not representative enough.

Therefore, this study aims to examine the implementation of interactive power points as digital-based learning media in increasing students' understanding of temperature and heat materials, ranging from understanding, types, properties, and differences in temperature and heat, as well as examples of temperature and heat. The learning process is carried out by applying interactive power point media equipped with illustrated images, videos, audio, hyperlink features, and mini games to make it more interesting. Through the use of these features, it is expected that students can participate actively during the learning process, so that learning objectives can be achieved effectively.

This problem is deemed necessary to be investigated because, based on the results of initial observations, the researchers found several new things in the study, including (i) there are still few articles that discuss the "Temperature and Heat" teaching material, (ii) conventional collaborative learning methods and demonstrations through online learning, and (iii) using interactive power point media that are interesting and have never been used by teachers in schools that are the object of research. The learning process is carried out online through

Google Meet by combining conventional teaching methods and demonstrations without eliminating the involvement of the use of learning media that can increase student interest in learning.

2. Method

Figure 1 shows the design research. This research is quantitative research with a pre-experimental research design. The approach used in this research is a pre-test and post-test one-group design approach. The approach was carried out in one group without any group comparisons.
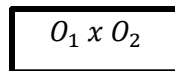
$$O_1 \; x \; O_2$$

Figure 1. Research Design

Description   :
O_1 : Pre-Test Score
x : Treatment
O_2 : Post-Test Score

The learning method used in this research is a digital-based learning method. The subjects in this study were fifth grade elementary school students in the city of Bandung, numbering 37 people. Learning is done by combining conventional teaching methods with demonstrations. The researcher uses interactive power point media that is designed as attractively as possible with illustrations, videos, audio, hyperlink features, and mini games to explain the theory of temperature and heat. The learning process is carried out online through Google Meet.

Prior to learning, students are required to fill out pre-test questions for 15 minutes via Google Forms. It is intended so that researchers can measure the initial knowledge that students have about temperature and heat. Then the researchers will provide treatment in the form of teaching temperature and heat using interactive learning media power point for 150 minutes. To measure the level of understanding of students after giving gifts, researchers used an evaluation form in the form of a post-test with 20 questions, which was then given to students after the learning process was completed. The post-test working time is 15 minutes.

The data analysis technique used is descriptive analysis. The data analyzed is the implementation of interactive power point as a digital learning medium and is based on student learning outcomes obtained from the pre-test and post-test scores.

3. Results and Discussion

Table 1 shows the percentage difference between pre-test scores and post-test scores obtained by students. From the 20 items on the pre-test and post-test questions that we provide, 15 items experienced enhancement percentage scores, including on questions numbers 2, 4, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, and 20. The increase in the score was supported by the first by giving treatment on topics that were carried out using video as an interactive power point element, so that students' interest and focus increased. This argument is supported by the results of research by Afrilia et al. who concluded that power points are able to make students more active, creative, and innovative, so that they can make students more focused on learning [15]. Second, the delivery of the topic uses the demonstration

method, so that students get a more valuable and meaningful learning experience. This is supported by the results of research by Maryanti et al. which states that the experimental demonstration method is able to improve students' understanding [16]. Third, provide attractive illustrations accompanied by concrete examples of giving in everyday life so as to facilitate student understanding. Purwanti mentions that illustrated images can be used in learning to improve students' cognitive abilities. Fourth, the delivery is done repeatedly, so that it can last a long time in the memory of students [17]. Fifth, emphasize the verbal and visual discussion points, such as differentiating the use of fonts for keywords, so that students can continue to remember them. Giving emphasis both visually and verbally is considered effective in improving student learning outcomes [18].

In question number 1, there was no increase in the value of learning outcomes because all students were able to answer correctly both during the pre-test and post-test. The same thing also happened to question number 13, namely that the results of the pre-test and post-test were stagnant. This is because the lack of in-depth explanations makes students unable to remember all the existing temperature units. While the decrease in percentage occurred in questions numbers 3, 12, and 14, The main reasons for the decrease were: (i) students did not understand the concept even though they had been given treatment, so they had difficulty answering the questions; (ii) a lack of in-depth explanations makes students unable to remember the material presented; and (iii) the author provides a tricky answer choice, so that students are fooled into answering it. The presence of distractors in questions is able to show students' cognitive abilities and concentration [19].

Table 1. **Difference Score Pre-Test and Post-Test Student**

No.	Question	Percentage (%)		
		Pre-Test	Post-Test	Difference
1.	Items that can be produce energy hot called source energy hot.	100.00	100.00	0.00
2.	Fire is source energy hot biggest for creature live on earth.	48.65	59.46	10.81
3.	Plant utilise Ray Sun for …	40.54	35.14	-5.40
4.	Long ago, human could produce fire with way …	81.08	100.00	18.92
5.	we can produce energy hot with rub 2 objects.	86.94	91.89	5.04
6.	Temperature is the quantity that states point hot something substance.	35.14	59.46	24.32
7.	Unit hot is …	37.84	56.76	18.92
8.	Thomas Alva Edison is inventor thermometer.	37.84	78.38	40.54
9.	Heat is degrees hot it's cold something thing.	37.84	48.65	11.17
10.	Included type displacement heat is …	24.32	59.46	35.14
11.	Glass broken glass because pour hot water caused by…	35.14	70.27	35.13
12.	Reamur is unit for measure heat.	45.95	32.43	-13.52
13.	Celsius is unit for measure hot.	48.65	48.65	0.00
14.	one characteristic features temperature is could change form thing.	40.54	29.73	-10.81
15.	Heat known with designation energy hot.	97.30	100.00	2.70
16.	Steam hot no could used as generator electricity.	67.57	72.97	5.40
17.	is sense touch man could measure temperature something thing?	35.14	45.95	10.81

18.	Heat move from …	54.05	89.19	35.14
19.	Temperature and heat are 2 different things.	86.49	100.00	13.51
20.	Temperature and heat compare straight, more big energy heat so will the more tall temperature.	89.19	100.00	10.81

Table 2 explains the distribution frequency of students' pre-test and post-test scores. It can be seen that the average pre-test score of students is in the "Enough" category, which is 11.30. While the average value of the post-test is in the "high" category, which is 13.78. This figure shows the results of an increase in the average value of student learning outcomes of 2.48 in the learning of temperature and heat. This shows that after giving treatment in the form of teaching using interactive power point media, there was an increase in students' understanding of the theory of temperature and heat.

Table 2. Distribution Frequency Score Pre-Test and Post-Test Student

Range Score	Category	Frequency Student		Percentage (%)	
		Pre-Test	Post-Test	Pre-Test	Post-Test
17 - 20	Very High	0	6	0.00	16.22
13 - 16	Tall	12	20	32.43	54.05
9 - 12	Enough	21	10	56.76	27.03
5 - 8	Not enough	4	1	10.81	2.70
0 - 4	Very Not enough	0	0	0.00	0.00
	Amount	37	37	100.00	100.00

Average Score	
Pre-Test	11.30 (Enough)
Post-Test	13.78 (High)

Based on this description, overall teaching using interactive power point online media has succeeded in increasing students' understanding of the material presented. The combination of conventional teaching methods and demonstrations with the application of digital-based learning media in the form of interactive power point can provide different activities and experiences for students. Although this research still involves conventional teaching methods, researchers always provide space for all students to participate actively during the learning process. Through active participation, students can get valuable activities and experiences that help with learning.

Based on the results of interviews with fifth grade teachers, during online learning during the COVID-19 pandemic, teachers only relied on WhatsApp social media for delivering learning. Generally, teachers will send materials and photo assignments through group classes. Teachers have not used e-books as a learning resource because parents are not able to use them. It is the same with the use of other digital-based learning media. This causes teachers to be less able to optimize the use of digital-based learning media.

Therefore, the use of interactive power point as a digital-based learning medium can help students develop their imagination and creativity, especially in online learning conditions. Elementary school-aged students are easily stimulated if new and interesting cases are displayed, so that they can foster an interest in learning. Interactive power points are able

to facilitate various student learning styles, ranging from visual, auditory, and kinesthetic learning styles. Based on this description, this study can prove that the use of interactive power points as a digital-based learning medium is effective in improving students' understanding, as indicated by the increase in science learning outcomes for fifth grade students, even though the learning process is carried out online.

4. Conclusion

The science learning process about temperature and heat carried out on 37 students of Class V Elementary School in Bandung through Google Meet showed positive results. The implementation of interactive power point as a digital-based learning medium is able to attract students' attention, so that students can easily understand the material being studied. Although the learning process is carried out online, the interactive use of power point is still effective in increasing students' understanding of the theory of temperature and heat. This is evidenced by the increase in student learning outcomes. After being given treatment, students get an increase in learning outcomes of 2.48. Therefore, the students' post-test scores were in the "High" category, with an average of 13.78. The increase shows that 68.92% of the material presented can be understood by students. Factors that influence the increase are the use of digital-based learning methods and media that are relevant to the material and are accompanied by the active participation of students in learning. These things can attract students' interests, make students focus, and ensure that they don't feel bored during the learning process. Therefore, interactive power points can be a solution for teachers to overcome the delivery of material that is considered difficult.

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