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Increasing the Understanding of the Physical Concept through the Usage of Video based on Natural Phenomena of Students in Grade VIII Mts. As'adiyah Puteri II Sengkang Center

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Abstract

The study is a classroom action research, which aims at describing the comprehension of physics concept using natural phenomenon-based video of grade VIII students at MTs. As'adiyah Puteri II Pusat Sengkang. The research design employed path diagram in classroom action research (an adaptation of classroom action research stage of Mikayla-Exactio Tunujaya & Mumu model). The research subjects were students of grade VIII-1 at MTs. As'adiyah Puteri II Pusat Sengkang. The test of comprehension of physics concept and video of natural phenomenon-based were validated by two experts. Based on the results of the study, it is discovered that there is improving the percentage of comprehension of physics concept using natural phenomenon-based video, namely 34.78% in cycle 1 with 8 students obtain the incomplete score. There is 65.22% with 15 students obtain a complete score in cycle 1. In cycle 2, there is the improvement of comprehension of physics concept to 100% complete with 23 students who obtain a complete score. It indicates that there is an improvement of comprehension of physics concept with indicators of translation, interpretation, and extrapolation by using natural phenomenon-based video.

Keywords: Natural Phenomenon; Video; Comprehension of the Concept

I.   Introduction

Educators and students still dominate the view that knowledge as a set of facts must be memorized, then lectures become the main choice of teaching and learning strategies in boarding schools and schools. So that in the practice of education that has been taking place in schools/boarding schools, it turns out that it is very far from the true nature of education, namely education that makes students as human beings who can learn to develop their potential and develop further knowledge for their interests in solving the problems observed.

The statement is following the definition of learning, which is essentially the process of interaction with all situations that exist around learners can be seen as a process directed towards the achievement of goals and the process of acting through various experiences created by educators. Learning is also a process of seeing, observing, and understanding something that is around students. (Rusman, 2017: 75).

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II. Theoretical Basis

Based on these observations the researchers found learning problems within the scope of the MTs school, As'Adiyah Puteri II, Sengkang Center. It can be said that students need solutions that can change students' perceptions that Physics Science is very difficult and even tends to be considered a scourge of monsters for MTs students. As'Adiyah Puteri II, Sengkang Center. Therefore, most students are not able to understand the concept of physics itself and the natural phenomena around it.

The use of video capture programs can be taken from Youtube according to the material needed, this is very clear, is a solution to the problems faced to improve understanding of physics concepts of students. While the video according to Agnew and Kellerman (1996) in the book (Munir, 2015: 18). Video is a tool or media that can show a simulation of real objects.

Based on the results of research from several researchers including; According to Istiqamah, (2014) et al. After being treated using video media in the experimental class and conventional learning models in the control class, both classes have increased understanding of the concept from the initial state. This can be seen through the results of the post-test analysis. The average post-test score of students' conceptual understanding in the control class was 41.48 with the standard deviation was 9.84 and the experimental class was 61.90 with a standard deviation of 12.52. Based on the results of the post-test students' understanding of the concepts in the experimental class and the control class both experienced changes. Video as an aid in delivering learning information is felt by researchers to be able to make students active, moreover, the video shown is designed as attractive as possible but still, the content of the video refers to the content of existing learning material.

According to Smaldino in (Istiqamah), he stated that the appearance of videos that can be repeated as desired makes students motivated to observe and analyze phenomena in daily life. According to Retno (2013), one of the media that can be used in physics learning is learning media in the form of audio-visual or video which is packaged by displaying videos in the surrounding environment and called video media physics events.

According to Ain (2013), an increase in understanding the concept of physics after being treated, the normality calculation data can be concluded that the pre-test and post-test data are normally distributed with 95% reliability, with the significance of learning being an indicator of research success. One of the prerequisites for meaningful learning is potentially meaningful material. The success of the indicator achievement of increasing students' understanding of concepts due to the positive response by students.

Understanding is the result of the teaching and learning process which is characterized by the ability to explain or define information in their own words. Understanding is the ability to explain and interpret something. One aspect of the cognitive realm put forward by Benyamin S.Bloom is the comprehension aspect. (Bloom, 1956: 91) explains the definition of understanding:

> "Comprehension that when students are confronted with communication, they are expected to know what is being communicated and to be able to use some of the material or ideas contained in it. The communication may be in oral or written form, in verbal or symbolic form. "

The statement can be interpreted that, understanding is when students are confronted with communication, they are expected to know what is being communicated and can use the ideas contained in the communication. Also, the educational taxonomy structure developed by Bloom follows a six-level pyramid model. Generally, (educators) use Bloom's taxonomy when making Lesson plans and more in the realm of knowledge and understanding of the highest realm that is used is practice. Other domains are rarely touched. (Chatib, 2014: 140).

According to constructivist theory, intellectual development is a process in which children actively build their understanding of the results of experiences and interactions with their environment. Children actively build their knowledge by continuously accommodating and assimilating the information received
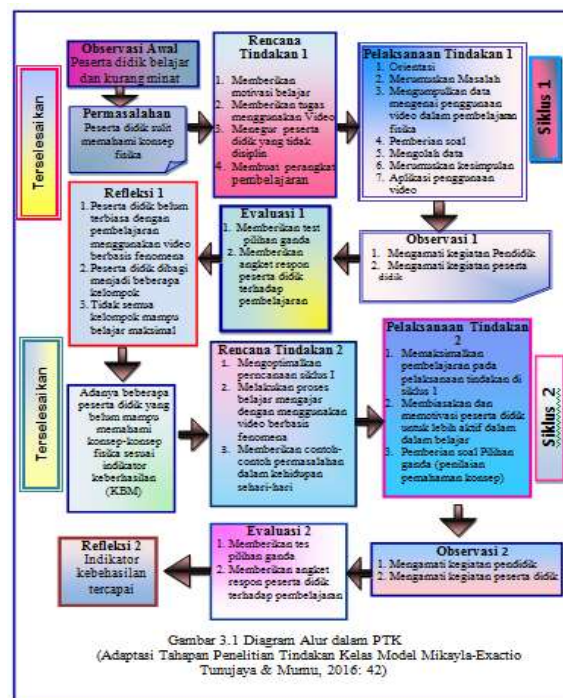
Gestalt theory emphasizes complex intellectual processes such as language, thought, understanding, and problem-solving as the main aspects of the learning process. According to Gestalt theory, learning is the process of developing insight. Insight is an understanding of the relationship between parts in a problem situation that can be associated with student activities, so the learning process occurs.

III. Research Methods

A. Types of Research

This research is a Classroom Action Research conducted in the form of 2 cycles. After the focus of the research, the problem has been determined, a class action research process is carried out which includes four parts in one cycle namely: action planning, action implementation, observation, and reflection. From these four activities, the problems found in the previous cycle were corrected in the next cycle.

This class action research, consisting of independent variables and dependent variables. The dependent variable is the conceptual understanding test and the independent variable namely video based on natural phenomena. To get a clear understanding and understanding of the variables in this study,

Gambar 3.1 Diagram Alur dalam PTK
(Adaptasi Tahapan Penelitian Tindakan Kelas Model Mikayla-Exactio
Tunujaya & Mumu, 2016: 42)

1. Understanding concepts is the ability of students to understand concepts, both translational, interpretive, and extrapolated which are marked by scores after working on the concept understanding tests in the form of multiple-choice tests consisting of low, moderate, high and very high categories.

2. Video-based on natural phenomena is a video consisting of activities, events or natural phenomena that can be found around the environment of students that are packaged in the form of videos.

B. Subject, Location And Research Time

The subjects in this study were class VIII-1 totalling 23 students. This research was conducted at MTs. As'Adiyah Puteri II, Sengkang Center. The study was conducted in odd semester 2019/2020 school year. For cycle 1, it will be held on Saturday, August 24, 2019, until Saturday, September 7, 2019. For cycle 2, it will be held on Monday, September 9, 2019, until Monday, September 23, 2019.

C. Data Collection Techniques

1. Data on the results of observations of students' activities and behaviour in learning using natural phenomena based videos based on the lesson plans implemented in teaching and learning activities.

2. Data on the results of the questionnaire sheet responses of students on learning physics to improve understanding of physics concepts through the use of videos based on natural phenomena

D. Research Instruments

1. Data about learning physics through the use of videos based on natural phenomena is obtained from students' understanding of physics concepts in the form of multiple-choice questions 40 numbers per sub-chapter of the discussion. For cycle 1 consists of 40 items before validation, after validation consisting of 28 valid items, 12 invalid items. Then revised to 37 items. Then an empirical test was carried out into 35 items ready to be used in research. For cycle 2 consists of 40 items before validation, after validation consisting of 28 valid items, 12 invalid items. Then revised to 37 items. Then an empirical test was carried out into 32 items ready to be used in research.

2. Provision of written tests/tests carried out at the end of each cycle. Data on the level of understanding of physics concepts is obtained from the results of the first cycle test and second cycle test.

3. Data regarding the use of video-based on natural phenomena in the learning process using an observation sheet filled by the observer. The observer was taken from MTs Integrated Science Education. As'adiyah Puteri II, Sengkang Center. aims to observe students, with an observer assessment clearly, systematically and accurately.

4. Data on increasing student responses are carried out at the end of each cycle, after providing a conceptual understanding test using the student questionnaire response sheet.

E. Data Analysis Technique

1. Mastery Analysis of Students' Understanding of Concepts

The item validity test for all items using the Biserial Point Correlation equation is:

$$\gamma_{pbi} = \frac{M_p - M_t}{S_t} \sqrt{\frac{p}{q}}$$ (Arikunto, 2013: 78)

γ_{pbi} = Biserial correlation coefficient.

M_p = The mean score of the subject who answered correctly for the item whose validity was sought.

M_t = Average total score

S_t = Standard deviation of the total score

P = Proportion of students who answered right

Q = Proportion of students who answer incorrectly

To calculate item reliability the Kuder-Richarson 20 (KR-20) formula is used as follows:

$$r_{11} = \left(\frac{n}{n-1}\right)\left(\frac{s^2 - \sum pq}{s^2}\right)$$ (Arikunto, 2013: 79)

Information:

r_{ii} = Overall test reliability

p = The proportion of subjects who answered the item correctly

q = The proportion of subjects who answered the item incorrectly

$\sum pq$ = The number of times the product of p and q

n = The number of items

S = Standard deviation of the total score.

F. Indicators of Success

Indicators of the success of this study are:

1. If the results of the conceptual understanding test scores reach 100% of the moderate category with a score of> 75 then this research can be categorized as successful, meaning that there is an increase in understanding of physics concepts through the use of natural phenomena based videos on grade VIII students MTs. As'adiyah Puteri II, Sengkang Center

IV. Results and Discussion

The results of the study consisted of observations of the learning activities of students and educators in the Improvement of Understanding of Physics Concepts through the Use of Natural Phenomena Based Videos on Students of Class VIII MTs. As'adiyah Puteri II, Sengkang Center. Qualitative and quantitative analysis. The results of quantitative analysis are a description of the level of understanding of Physics Concepts of students. Qualitative analysis of student observation and student questionnaire responses.

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A. Cycle I

Table 4.1 Score Results of Understanding Tests on Physics Concepts of Students Cycle 1

No	Nilai Tes Pemahaman Konsep (Rentang)	Kategori	Frekuensi	Persentase %
1	67-74	Rendah	8	34,78
2	75-82	Sedang	8	34,78
3	83-90	Tinggi	4	17,40
4	91-98	Sangat Tinggi	3	13,04
	Jumlah		23	100%

Sumber: Data Primer Sekolah Terolah 2019

The score of the physics concept understanding test results through the use of video-based on natural phenomena in cycle 1 students can be seen in Table 4.1. if the video views only 1 view.

From reflection cycle 1 several problems have been found including:

1. Learners want to watch videos in a long and repetitive duration.

2. Students want to try themselves to open video links.

3. Students have not been able to clearly understand the purpose of the video content.

4. Learners still need maximum guidance from educators formulating the problem, formulating hypotheses, and making conclusions.

5. Students are less active in collaboration with group members. Study groups have not worked optimally.

6. Students do not understand the examples of problems found and need guidance from educators.

B. Cycle 2

Table 4.1 Score Results of Understanding Tests on Physics Concepts of Students Cycle 2

No	Nilai Tes Pemahaman Konsep (Rentang)	Kategori	Frekuensi	Persentase %
1	67-74	Rendah	-	-
2	75-82	Cukup	10	43,48
3	83-90	Tinggi	11	47,83
4	91-98	Sangat Tinggi	2	8,69
	Jumlah		23	100%

Sumber : Data Primer Sekolah Terolah 2019

Based on the reflection cycle 2, it can be analyzed as follows:

1. Assessing students' activities and behaviour in learning using video-based on natural phenomenon. cycle conducted by 2 observers. The observer evaluation results are in the excellent category.

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2. The score of the test results in understanding the physics concepts of students after the use of video-based on natural phenomena in cycle 2 a significant increase. The concept of understanding test results can be seen from 34.38% of students who get enough (incomplete) category scores to 0%.

3. The results of students 'responses to the use of videos based on natural phenomena in cycle 2 can be seen as an increase in the score of 5 indicators of students' responses. Table. 4.3 Improved score.

The results of the questionnaire responses of students cycle 1 and cycle 2.

No	Indikator	Siklus 1		Siklus 2	
		Jumlah Item	Rerata Skor	Jumlah item	Rerata skor
1	Perasaan Senang	10	96,44	10	104,43
2	Keaktivan Peserta Didik	7	111,16	7	109,74
3	Manfaat Belajar Fisika	4	120,87	4	120,87
4	Suka Tantangan	4	83,05	4	86,09
5	Tanggung Jawab	5	108,15	5	114,78
Sumber : Data Primer Sekolah Terolah 2019					

For cycle 1 in the unfinished category, there are 8 students with a percentage of 34.78% because students have not been able to understand the learning objectives if the video is shown 1 time. Compared to Cycle 2, none of the students scored below 75 (the completeness of the conceptual understanding test). This indicates an increase in understanding of physics concepts through the use of videos based on natural phenomena in grade VIII students MTs. As'adiyah Puteri II, Sengkang Center.
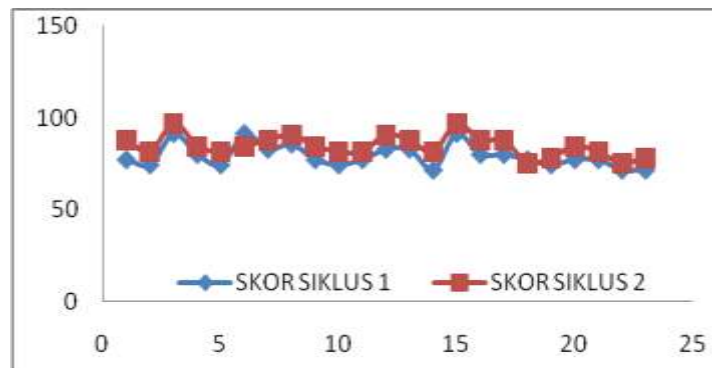

Figure 4.1. Improving Scores of Physics Concept Understanding Test Results Through the Use of Natural Phenomena Based Videos on Class VIII Students Cycle 1 and Cycle 2. (September 2019)

Source: Primary School Data Processed in 2019.

The implementation of classroom action research conducted in the odd semester of the 2019/2020 school year was successful. Because all respondents numbered 23 people in cycle 2 obtained a score of understanding the concept of completion category from 65.22% to 100%, while for the unfinished category it became 0%.

Conclusions

A. Conclusion

Understanding students' physics concepts through the use of videos based on natural phenomena in grade VIII students of MTs.As'adiyah Daughter II Sengkang Center Experiencing Improvement. There is a 65.22% physics concept comprehension test score with 15 students getting a moderate category score, while a cycle 2 physics concept comprehension test score that gets a 100% average score with a total of 23 students. The increase in the conceptual understanding test scores shows an increase in the understanding of the physics concepts of VIII MTs students. As'adiyah Puteri II, Sengkang Center.

B. Suggestions

We recommend opening a video based on natural phenomena not using a cellphone but using a laptop so that the video is more clearly watched and observed.

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