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THE EFFECT OF IMPLEMENTING PROBLEM BASED LEARNING WITH VIDEO MEDIA ON CRITICAL THINKING SKILLS, CREATIVE THINKING SKILLS AND UNDERSTANDING STUDENT CONCEPTS

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Abstract

This study aims to determine the effect of the application of problem based learning with video media on critical thinking skills. The data analysis technique used the Kruskal Wallis statistical test The ability of critical thinking skills, creative thinking skills and understanding of students' concepts is still low so it needs to be improved to achieve minimal learning completeness. The sampling technique used research instruments and test question sheets. The sample of students in grades VII-A, VII-B, VII-D of SMP Negeri 2 Tenggarong Seberang, Kutai Kartanegara Regency, East Kalimantan Province, Indonesia.. The results of the data analysis showed that the Problem Based Learning model with video media had no significant effect on critical thinking skills with H = 4.17 and students' conceptual understanding with H = 2.588 but had a significant effect on creative thinking skills with H = 12.659 so that it affected learning completeness.

Keywords: *Problem Based Learning, Video Media, Critical Thinking Skills, Creative Thinking Skills, Concept Understanding.*

One of the efforts made to improve critical thinking skills, creative thinking skills, and understanding of students' concepts is by applying the Problem-Based Learning learning model with video media. Problem-Based Learning is a learning model that encourages students to think critically and creatively in analyzing and solving complex real-world problems (Muhidin Palennari, 2018). Meanwhile, critical thinking is a high-level thinking, using the basis of argumentation analysis and insight into each meaning and interpretation to develop cohesive and logical reasoning (Liliasari, 2003) In line with that, Nurul Hasanah (2018) states that the Problem Based Learning model can encourage students to be skilled in critical thinking and problem solving.

In the Problem Based Learning learning model students learn to analyze and solve problems in the real world. Problem-Based Learning with video media in learning is expected that students are able to develop their thinking critically, especially in participating and finding solutions to real-world problems that exist in the surrounding environment.

Based on the results of interviews conducted with Mrs. Thabita, S.Pd from SMP Negeri 3, Mrs. Mardiah, S.Pd from SMP SPT Separi, Mrs. Siti Khotijah SMP from Negeri 4 and Mr. Israyantho from SMP Negeri 2 Tenggarong Seberang as a science teacher on January 23, 2020 that students' critical thinking skills, creative thinking skills and conceptual understanding are still in the middle and low ranges. The average completeness of learning is not more than 15 students (53.5%) of 28 students for SMP Negeri 2 Tenggarong Seberang and 10 students (66.6%) of 15 students for SMP Negeri 3 Tenggarong Seberang complete with a minimum score of 75. Meanwhile, SMP SPT Separi 15 students (51.7%), from 29 students and 15 students of SMP Negeri 4 Tenggarong Seberang (60%) of the total 25 students completed with a minimum score of 70.

There are many kinds of learning media used, one of which is video learning media. Video is one of the audio-visual learning media that can deliver messages by involving auditory and visual stimuli so that students are expected to better understand the subject matter delivered by the teacher. Based on the results of the study, students who experience the learning process using video media understand better and better understand the concepts of the Biology material presented (Sutiknyo, 2016).

In line with that, MA Juniardi, et al .., (2017) said that video learning media are able to create fun learning, increase students 'insight, can strengthen students' memory, make it easier to understand subject matter. Natural Science or what is commonly called IPA is one of the subjects that students fear

In addition to critical thinking, it is hoped that the Problem-Based Learning learning model with video media can improve students' creative thinking skills. Yulianingtias, et al…, (2016) stated that in the application of the Problem-Based Learning Model with video media students can maximally use all their abilities to search and investigate a problem systematically, critically and analytically. Creative thinking is one aspect of current learning assessments, which is included in the criteria for assessing the knowledge or cognitive aspects.

In addition to critical thinking skills, creative thinking skills, it is hoped that the Problem Based Learning learning model will also affect students' conceptual understanding. This is in line with the statement of Eka Yulianti, et al., (2019) that in addition to affecting critical thinking skills, the Problem Based Learning model also affects students' conceptual understanding. With the Problem Based Learning learning model, it is hoped that students will be better able to understand the concepts of the subject matter given. Especially subject matter concepts that have to do with Natural Sciences.

Based on the survey results critical thinking skills, creative thinking skills and concept understanding of students at SMP Negeri 2 Tenggarong Seberang are still low so it is hoped that the Problem Based Learning learning model with video media can improve critical thinking skills, creative thinking skills and understanding of students' concepts.

This study aims to determine the effect of the application of Problem Based Learning with video media on critical thinking skills, creative thinking skills and conceptual understanding of students on environmental pollution material.

METHOD

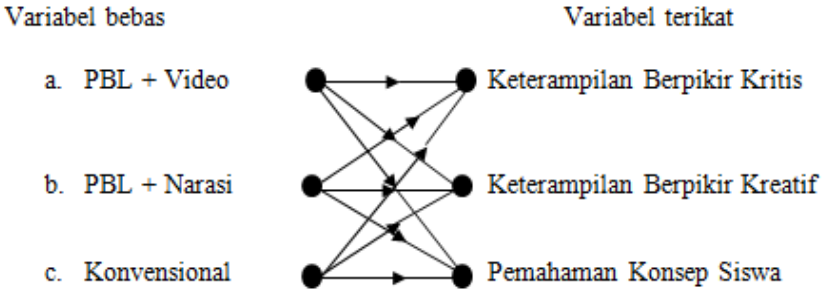
This type of research is a quasi experimental research.

Population: All grade VII students of SMP Negeri 2 Tenggarong Seberang.

Sample: The sample of all students in grades VII-A, VII-B, and VII-D of SMP Negeri 2 Tenggarong Seberang. The sampling technique used purposive sampling with inclusion criteria.

Research design

1. Variable Identification
   a) independent variable, b) dependent variable
2. Relations between variables



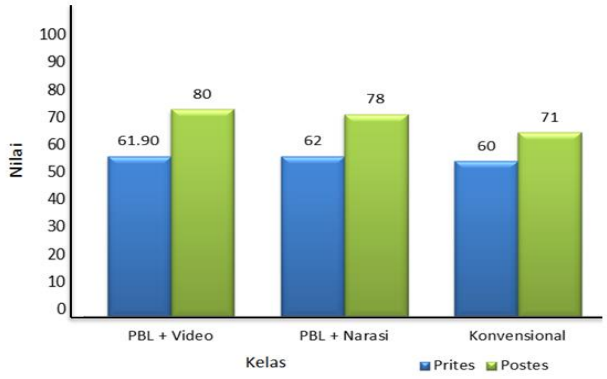
3. Research design
   The research design used nonequivalent pretest-posttest control group design using two control classes, namely one positive control class and one negative control class, and one experimental class.
4. Data collection technique
   Data collection techniques using research instruments in the form of 1) questionnaire, 2) test questions sheet. To determine the reliability of the instrument used the Cronbach's Alpha test method, while the validity used the Spearman Correlation test.
5. Data analysis technique
   Percentage descriptive statistics and non-parametric statistics Anova on Rank using the Kruskal-Wallis method.

DISCUSSION

Research Results Critical Thinking Skills, Creative Thinking Skills and Concept Understanding.

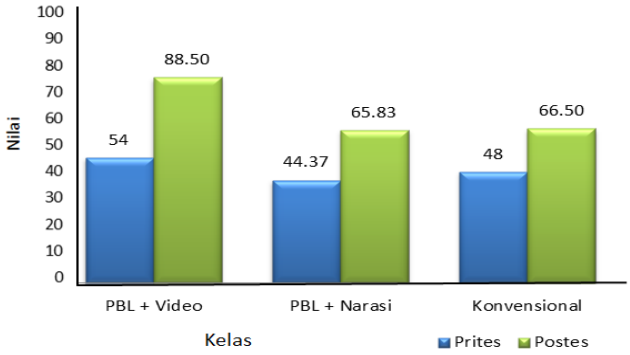
Research Data

a. Critical Thinking Skills



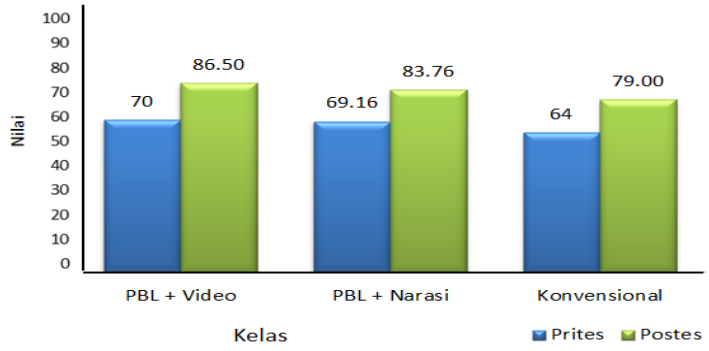
Graph 4.1 Graph of the value of critical thinking skills

b. Creative Thinking Skills



Graph 4.2 Graph of the value of creative thinking skills

c. Understanding Student Concepts



Graph 4.3 Graph of the value of concept understanding

Data analysis

Non-Parametric Statistical Test on Pretest and Post-Test Data of Research Results

a. Critical Thinking Skills

Kruskal-Wallis One Way Analysis of Variance on Ranks

Group	**N**	**Missing**	**Median**	**25%**	**75%**	
PBL + Video	20	0	15,000	10,000	25,000	
PBL + Narrative	24	24	0	15,000	5,000	
Conventional	20	0	7,500	5,000	13,750	25,000

H = 4.715 with degrees of freedom, df = 2. (P = 0.095)

b. Creative Thinking Skills

Kruskal-Wallis One Way Analysis of Variance on Ranks

Group	**N**	**Missing**	**Median**	**25%**	**75%**	
PBL + Video	20	0	35,000	22,500	40,000	
PBL + Narrative	24	24	0	15,000	10,000	30,000
Conventional	20	0	15,000	10,000	27,500	

H = 12,659 with degrees of freedom, df = 2 (P = 0.002)

To isolate different groups from the rest, a multiple comparison procedure further test was used. All pairwise multiple comparison procedures (Dunn's Method).

Comparison	**N**	**Diff of Ranks**	**Q**	**P <0.05**
PBL + Video vs Conventional	20 0	18,975	3,223	Yes
PBL + Video vs PBL + Narrative	24	15,521	2,753	Yes

PBL + Narrative vs Conventional 20 0	3,454	0.613	No

Table 4.1 Data on Difference in Class Mean Value

	PBL + Video	PBL + Narrative	Conventional	Information
PBL + Video	-	22.67	22.00	
PBL + Narrative	22.67	-	0.67	
Conventional	22.00	0.67		

c. Concept Understanding

Kruskal-Wallis One Way Analysis of Variance on Ranks

Group	**N**	**Missing**	**Median**	**25%**	**75%**	
PBL + Video 20 20	0		20,000	10,000	20,000	
PBL + Narrative	24	24	0	10,000	10,000	20,000
Conventional 0 20	0		10,000	10,000	17,500	

H = 2.558 with degrees of freedom, df = 2 (P = 0.278)

The final result of the statistical test is that if the p value <the maximum critical limit of 0.05, the alternative hypothesis can be accepted. Conversely, if the p value> 0.05, the hypothesis will be rejected (Guntur Nurcahyo, 2018.

1. The effect of the application of Problem Based Learning with video media to improve students' critical thinking skills on environmental pollution material.

   From the results of the Kruskal Wallis statistical test that has been carried out, it is obtained that H = 4, 715 with df = 2 and p value = 0.095. The results of the Kruskal Wallis test analysis show that the results of the calculation are under H table 5.991 with a significance level of 0.05 (Dita Yuwono, 2020) Based on these results, for the three classes with different treatments it can be said that there is no significant difference because the p value = 0.095 is above the alpha 0.05 (Anwar Hidayat, 2014).

   Meanwhile, based on the results of these statistical tests, it can also be seen that there is no influence between the independent variables of the three classes with different treatments on critical thinking skills.

Table. 1 Critical thinking skills

Class	Mean of Pretest Values	Average Posttest Value

PBL + Video	61.90	80.00
PBL + Narrative	62.00	78.00
Conventional	60.00	71.00

Problem-Based Learning is a learning approach in which learners work on authentic problems with the intention of compiling their own knowledge, developing inquiry and higher-order thinking skills, developing independence and self-confidence.

This is in accordance with the findings of Nurul Hasanah (2018) that Problem Based Learning can encourage students to think critically in solving problems. This finding is also reinforced by Ni Wayan Suarniati (2019), that Problem Based Learning can improve critical thinking. Meanwhile, based on the findings of DM Aswan, et al ..., (2018) that Problem Based Learning affects students' critical thinking skills and competence.

Based on the results of the study, students who experience the learning process using video media understand better and better understand the concepts of Biology material presented (Sutiknyo, 2016) and can improve critical thinking skills of Muthia I. Putri, et al…, (2018).

2. The effect of the application of Problem Based Learning with video media to improve students' creative thinking skills on environmental pollution material.

From the results of the Kruskal Wallis statistical test that has been carried out, it is found that H = 12.659, df = 2 and p value = 0.002. From the results of statistical test analysis, it shows that the count is above the value of H table 5.991. with a significance level of 0.05. With p = 0.002, the value is below the alpha of 0.05. Based on these results it can be seen that the difference in the median value between classes is greater than expected and whether the difference is accidental.

To find out which class is different from the others, a follow-up test is used with the pairwise multiple comparison procedure using the Dunn's method. From further tests with the Dunn's method it is known that between the Problem Based Learning model with video media and conventional class, the value of Q = 3,223 means that there is a significant difference. This result is also reinforced by the difference in the average score between the two classes of 22.00.

While the class with the Problem Based Learning model with video media and the class with the Problem Based Learning model with narrative media, the value of Q = 2.753, from the results of these two classes are significantly different. This result is reinforced by the difference in the average score between the two classes of 22.67.

While the class with Problem Based Learning model learning with narrative media and conventional class with the value of Q = 0.613, based on these results the two classes showed no significant difference.

Table. 2 Creative thinking skills

Class	Mean of Pretest Values	Average Posttest Value
PBL + Video	54.00	88.50
PBL + Narrative	44.37	65.83

Conventional	48.00	66.50

From the results of statistical tests that have been carried out, it can be said that the Problem Based Learning learning model with video media has an effect and can improve students' creative thinking skills.

As stated by Dasna and Sutrisno (2007: 79) in Qurrota Aina, et al…, (2017) Problem-Based Learning should be used in learning because this model will help students learn to solve problems so that the learning process becomes more meaningful; can improve higher-order thinking skills, foster initiative at work, self-motivation to learn, and solution to a problem.

The use of Problem-Based Learning with video media in this study is because through the implementation of these models and media, students can maximally use all their abilities to search and investigate something systematically, critically, logically and analytically Yulianingtias, et al ..., (2016) and (2016) and (Coryna, et al .., 2017). This opinion is also reinforced by the results of previous research that the Problem-Based Learning learning model can improve students' creative thinking skills (Ibnu Ainun Najib, et al ..., 2016), because in the Problem-Based Learning model students are taught to face a factual problem in daily life. - days and trained to find solutions.

In learning, students design and make a simple water purification tool made from nature by utilizing natural materials that are around the student's environment. This is also reinforced by the results of research by DK Sari (2017), with practicum made from local materials can improve students' creative skills.

3. The effect of the application of Problem Based Learning with video media to improve students' conceptual understanding of environmental pollution material.

From the results of the Kruskal Wallis statistical test that has been carried out, it is obtained that H = 2, 558 with df = 2 and p value = 0.278. Based on the results of statistical test analysis, it can be seen that these results are below the H table of 5.991 with a significance level of 0.05. Thus these results indicate that for the three classes with different treatments, it can be said that there is no significant difference and the p value = 0.278 is above 0.05 alpha.

The following is Graph 4.3 of the results of the pretest and posttest from the three classes used as the research sample.

Table. 3 Understanding of the concept

Class	Mean of Pretest Values	Average Posttest Value
PBL + Video	70.00	86.50
PBL + Narrative	69.16	83.76
Conventional	64.00	79.00

In accordance with the findings of Hartuti (2014), Problem Based Learning with audio-visual media can affect students' conceptual understanding. This finding was also confirmed by

Ihwan Khoiru Sadiqin, et al (2018), that problem-based learning models can improve students' conceptual understanding.

Students who have understood a concept can be indicated by the ability of students to explain in their own language, able to distinguish between examples and not examples, able to answer questions and ask questions and be able to make conclusions about a concept.

Teaching completeness criteria are a measure of success for a teacher in carrying out the teaching and learning activity process. If students are able to obtain a minimum score at the level of teaching completeness criteria, it can be said that the student has been complete in following and studying the material.

Table. 4 Results of learning evaluation based on KKM 75

Class	Mean of Pretest Values	Average Posttest Value
PBL + Video	61.95	85.30
PBL + Narrative	58.04	72.08
Conventional	58.85	70.80

Based on the results of the posttest for the class with the Problem Based Learning model with video media the students managed to obtain a minimum completeness score (value 75) of 100%. This shows that the Problem Based Learning learning model with video media is influential and can improve student learning completeness for the Environmental Pollution material being studied and students have been able to overcome their learning difficulties.

The results of the posttest for the class using the Problem Based Learning model with narrative media, the students managed to obtain a minimum completeness score (value 75) of 70.83%. While the Conventional class shows a level of learning completeness of 55%. Research should be carried out in good situations and conditions, so that the process of implementing learning activities can take place normally in the classroom. The scoring rubric should be better in the scoring procedure.

CONCLUSION

There is no significant difference between classes with Problem Based Learning learning models with video media, classes with Problem Based Learning learning models with narrative media and conventional classes on students' critical thinking skills on environmental pollution material.

There is a significant difference between the class with the Problem Based Learning learning model with video media, the class with the Problem Based Learning learning model with narrative media and the conventional class on students' creative thinking skills on environmental pollution material.

There is no significant difference between the class with the Problem Based Learning learning model with video media, the class with the Problem Based Learning learning model with narrative media and the conventional class on students' conceptual understanding of environmental pollution material.

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