



CAN VISUAL MEDIA IMPROVE PROBLEM SOLVING ABILITIES OF ELEMENTARY STUDENTS ON GEOMETRY?

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Abstract

Keywords:

Geometry, Visual Media,
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The aims of this study were (1) to reveal the students' ability to solve problems related to the area of the flat shape that was taught after using the Problem Based Learning model supported by visual media, (2) to reveal the students' ability to solve problems related to the area of the flat shape that was taught after using the Direct Instruction model supported by visual media, (3) to reveal whether there is an effect of the Problem Based Learning model supported by visual media on the ability to solve problems related to the area of a flat shape. This study uses a research design Nonequivalent Control Group Design with Quasi Experiment research techniques or quasi-experimental with a quantitative approach. The subjects of this study were fifth grade students of SDN Senurus. The data analysis used in this study was the One Sample T Test and the Independent Sample T Test. The conclusions of the results of this study are, (1) the ability to solve problems related to the area of the flat shape of the fifth grade students of SDN Senurus using the Problem Based Learning learning model supported by visual media, the results of the calculations obtained a significant value of 0.000 and a significant level of 5% which means the significance value is $0.000 < 0.05$ and the student's average score was 86.24, (2) the student's ability to solve problems related to the area of a flat shape using the Direct Instruction model supported by visual media, the results of the calculation obtained a significant value of 1,000 and with a significant level of 5% which means the value the significance is $1,000 > 0.05$ and the student's average score is 75.00, (3) there is an effect of the Problem Based Learning model supported by visual media on the ability to solve problems related to the area of the flat shape of class V SDN Senurus is proven by showing a significant value of 0.000 with the level 5% significant so there is a significant effect.

Introduction

The problem faced in the world of education is the weakness of the learning process (Ijirana & Nadjamuddin, 2019). In the learning process children are less encouraged to develop their thinking skills because the learning process in class is more directed at memorizing existing information (Bikić et al., 2016). The learning process currently has more roles for the teacher as the only source of learning for students. As a result, learning activities in the classroom are unidirectional or centered on the teacher and feel very boring so that students' absorption of the material provided is low, especially in Mathematics which has high enough difficulty for students and as a teacher it is difficult to deliver material so that it can be understood by students (Yusnia, 2018).

The Problem Based Learning learning model is very appropriate for the mathematics learning process because it uses problems as a focus for developing problem solving, materials, and self-regulation (Lai et al., 2015). The Problem Based Learning model is a model that includes it involve students to try to solve problems (Suhendri, 2015). The use of the Problem Based Learning model is expected that students are able to learn knowledge related to these problems and at the same time students are expected to have the ability to process and understand information or material (Pourdavood et al., 2020). The steps of the Problem Based Learning model proposed by Mufidah, Y., Affandi, L. H., & Ermiana (2021) have five phases, namely: (1) student orientation to problems, (2) organizing students (3) guiding individual or group experiences, (4) developing and presenting the work, (5) analyzing and evaluating the problem-solving process.

Visual media plays an important role in learning because it can facilitate student understanding and foster student interest in learning (Satriami et al., 2021). In using the Problem Based Learning learning model supported by visual media it is expected to increase student activity, because the teacher gives students problems to solve (Wagemans et

al., 2012). In line with the increased activity of students, students will have the ability to solve problems by themselves and students can understand a material well because students themselves are looking for how to solve the problem so that the understanding obtained will continue to be stored in their minds (Naug et al., 2016).

Method

The approach in this study uses a quantitative approach because to make it easier to analyze the data obtained, namely numerical data. Sugiyono (2016), explains "quantitative research as the name implies, many are required to use numbers, ranging from data collection, interpretation of the data, and the appearance of the results".

This research uses experimental research methods using research techniques in the form of quasi-experimental (Quasi Experiment). This study used 2 groups, namely the experimental and control class and used the research design Nonequivalent Control Group Design.

Table 1. Research design

Subjects	Pre-test	action	Post-test
Experiment Class	O ₁	X ₁	O ₂
Control Class	O ₃	X ₂	O ₄

This research was conducted at SDN Senurus, Karang Sideman Village, Batuk Liang Utara District, Central Lombok Regency. The subjects in this study were all students in grade V at SDN Senurus totaling 22 students.

The instruments in this study were the syllabus and lesson plans for the independent variables and tests or questions for the dependent variable (Anjos et al., 2016). The data collection steps in this study are, (1) giving students pretest questions before learning, (2) providing student material using the Problem Based Learning model for the experimental class and the Direct Instruction model for the control class, (3) giving posttest questions. to students after delivering the material, (4)

recording the scores obtained by students in working on pretest and posttest questions.

Result and Discussion

Based on the data analysis that has been carried out, it can be seen as follows:

1. The ability to solve problems related to the area of a flat shape using the Problem Based Learning model supported by visual media for Kelan V SDN Senurus students exceeds the minimum completeness criteria.

Evidenced by the One Sample T Test which shows a significant value of 0.000 and a significant level of 5%, which means that the significance value is $0.000 < 0.05$. In accordance with the decision norms, the results of hypothesis testing are obtained that H_0 is rejected and H_a is accepted.

Table 2. Test One Sample T Test

Test Value = 22						
t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		
				Lower	Upper	
PBL	9,3	36	,000	11,2	8,81	13,68

2. The ability to solve problems related to the area of a flat shape using the Direct Instruction model supported by visual media in grade V SDN Senurus students has not reached the minimum completeness criteria. Evidenced by the One Sample T Test which shows a significant value of 1,000 and with a significant level of 5%, which means the significance value is $1,000 > 0.05$. In accordance with the decision norm, the results of hypothesis testing are obtained that H_a is rejected and H_0 is accepted.

Table 3. Test One Sample T Test

Test Value = 22						
t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		
				Lower	Upper	
DI	,000	29	1,0	,000	-2,9	2,9

3. There is an effect of the Problem Based Learning model supported by visual media on the ability to solve problems due to the flat shape of the fifth grade students of SDN Lirboyo. Evidenced by the Independent T Test which shows a significant value of 0.000 with a significant level of 5%. In accordance with the decision norm, if the significant value (0.000) is smaller than the significant level (0.05), then H_0 is rejected and H_a is accepted.

In general, visual media are grouped into representational image media (pictures and photos), diagrams that show the relationship between concepts and content, maps that show the relationships between elements in the content of the material, and graphs (tables, graphs, charts) (Niehorster & Li, 2017).

Images or photos are graphic media that are most often used to help convey learning material to students in physical education (Hasselmann Bettin et al., 2020). Images or photos used can be in the form of hand paintings or prints. This media has various advantages over other graphic media. These advantages are (Tanaka et al., 2017); (1) concrete in nature. Pictures or photos can be seen by students more clearly and realistically showing the material or message conveyed, (2) overcoming space and time. To show an image of a stadium or basketball court, you do not need to see the real object but simply look at the image or photo, (3) minimize the limitations of eye observation. To explain certain objects that are difficult to observe, images or

photographs are used, (4) can clarify a problem. Image allows a problem to be understood equally, (5) cheap and easy .

Pictures or photos can be made by the teacher himself at a low cost and easy to use (Dimiyati et al., 2018). Images or photos also have disadvantages, among others, they only emphasize visual perception, are less effective if the objects / objects displayed are complex, and their size is very limited for large groups (Mukherjee & Howlett, 2015).

Wyatt-Smith et al. (2011) provides an overview of several concepts of using visual media to be effective, namely, the form of visual media is made as simple as possible so that it is easy to understand, the use of visual media to explain information contained in text, provide repetition of visual presentations and involve students in it, use the image to distinguish two different concepts, the caption must be outlined, and the use of color must be realistic. Many things must be considered in the use of visual media in supporting the physical education learning process in elementary schools (Ayuni & Setiawati, 2019).

By analyzing the test results, it can be seen that the misunderstanding made by students on the rectangular material occurs due to the students' lack of understanding of the parts and attributes of the quadrilateral components so that students have difficulty expressing the characteristics of these shapes (Hotimah et al., 2021). Misunderstanding made on the rectangular material also occurs due to students' lack of understanding of the concepts and principles of each quadrilateral so that students have difficulty defining each shape and also cause difficulties for students in understanding the related relationships between one quadrilateral. with another rectangle (Affandi et al., 2020).

In general, students' misunderstanding occurs due to the lack of student skills, especially skills in understanding basic concepts in rectangular material. In the learning process, it should provide something to remember so that the understanding of the basic concepts is embedded (Affandi et al., 2020). When one of the subjects was asked further about why he was unable to understand the parts and attributes of the rectangular shape components, the subject answered that the previous learning process only focused on the

teacher, the teacher only gave notes then gave questions without giving a learning process that stimulated students to be able to more interactive in the learning process.

Conclusion

Conclusion

Based on the research that has been done, the following conclusions can be drawn:

1. The ability to solve problems related to the area of the flat shape of class V SDN Senurus students using the Problem Based Learning model supported by visual media exceeding the minimum completeness criteria with an average value of 86.24 and a significant value of $0.000 < 0.05$.
2. The ability to solve problems related to the flat area of the fifth grade students of SDN Senurus using the Direct Instruction model supported by visual media has not reached the minimum completeness criteria with an average value of 75.00 and a significant value of $1,000 > 0.05$.
3. There is an influence of the Problem Based Learning model supported by visual media on the ability to solve problems related to the flat area of the fifth grade students of SDN Senurus. Evidenced by showing a significant value of 0.000 with a significant level (0.05), so there is a significant effect.

Suggestion

Based on the research that has been done, the following suggestions can be made:

1. A teacher should use an interesting learning model and media. The Problem Based Learning model that is supported by visual media can be an option for teachers so that the learning process runs well because in this model there is a challenge for students to solve a problem so that it makes learning active and interesting.
2. Make students always pay attention to the material presented during the learning process with attractive learning models and media so that learning objectives can be achieved and learning outcomes increase.

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