



## Solar System Teaching Aids as Self-Practicum Through Youtube to Improve Students Learning Outcomes

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### **ABSTRACT**

*The aim of this study is to remind the results of cognitive learning of learners by making solar system props through youtube. This research used pre-experiment with pretest posttest design. The research instruments used are questionnaires and tests. Research data analysis technique is to use quantitative analysis with the help of SPSS. The cognitive learning outcomes of learners increased from an average score of 57.67 to 85.33. This increase is due to the learner's understanding of the differences in characteristics and sizes between planets increased. Based on the results of the test t using SPSS, obtained  $Sign < 0.05$  which is 0.000. It can then be stated that there is a significant difference between the pretest and postes values. In other words, there is an increase in student learning outcomes after the implementation of discovery learning through the manufacture of solar system props.*

**Keywords:** *Solar System Props; Youtube; Cognitive Learning Outcomes.*

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### **INTRODUCTION**

Quality education is supported by a good learning process. As revealed by Agustin (2011) that learning is a form of growth or change in a person expressed in a new manner of behavior thanks to experience and practice due to interaction between individuals, and individuals with their environment. Syafriyansyah, Suyanto, and Putu Nyeneng (2013) also argues that the use of scientific methods in studying or even developing science is useful for gaining new knowledge in the form of practicum. Both opinions explain that there is a connection between humans, the environment and the development of science. The development of science can not be separated from the activity of learning.

Generally, learning activities are conducted directly in a classroom, where educators and students interact directly. However, since the COVID 19 pandemic learning has been conducted online. Boredom during online learning is one of the experiences experienced by students. This is due to monotonous learning, less varied intonation, and inaccessible interaction with friends and teachers. Therefore, the use of learning models can be applied effectively to support students' learning success. Related to the use of various learning models in teaching and learning activities (Wabula et al., 2020). With the appropriate learning model is expected to minimize boredom of students. In addition, (Vitasari, 2016) explained that less effective learning systems can lead to the delivery of difficult material to understand.

To solve these problems, a student-centered learning model is needed. The discovery learning model is one solution. Discovery learning model given to students is learning to solve problems and bring creativity to students. This is in line with the opinion of Sholihah, F., & Prihatiningtyas (2021) that discovery learning can bring creativity to students by utilizing tools and materials around students while improving the cognitive learning outcomes of learners.

Model selection in the learning process will be more effective if used tools that are learning media to channel information from educators to students. The material delivered will be more easily accepted and understood and make students more motivated and active. Yaswinda, Yulsyofriend, and Mayar (2018) stated that the use of natural materials as props is expected to be able to develop process skills which are an important device for scientific education, because with these props the lesson material can be easily understood by students.

Biological learning media applied in MTS At Taufiq Jombang, during online is handphone and computer. The media is used by teachers to assist students in understanding materials, especially solar

system materials. But based on the results of the need analysis questionnaire, the media props in the solar system have never been implemented. In addition, learning is less effective. This is because the task given by the teacher is a task with few responses so that students feel bored during online learning. The use of youtube application in MTS AT taufiq has also never been done. The function of utilization of youtube application in the manufacture of solar system props is able to store with a long and unlimited video capacity or duration. As expressed by Silahuddin (2015) that students can using electronic media, especially the internet as its learning system. One of which is an educational-based video and then upload it to the youtube and then they can watch and respond to the video they uploaded either in the form of suggestions, opinions or criticism of the material provided. The selection of solar system materials because in addition to the appropriate materials and menarik creating prop tools, this material has never used props or make props, so it is necessary to make props by students with the use of youtube application. This is expected to improve participants' cognitive learning outcomes.

## **METHOD**

The type of research used is pre-experimentation using pretest-posttest design. pretest before the implementation of Guide *Discovery Learning* so that the implementation results can be known more accurately by comparing the situation before and after treatment (Sugiyono, 2010). Design research as follows.

O1 X O2

Information:

O1 = pretes (before the implementation of guide discovery learning)

X = treatment with the application of discovery learning guide

O2 = posttes (after the implementation of guide discovery learning)

The research place is conducted in the home of each student. The time of this research was conducted in the even semester for 2meetings. This learning uses *whatsapp* app. The subjects of this study were MTS class IX students with a total of 15 students. This research procedure covers two stages, namely the preparation and implementation stage. Before taking the data, researchers made observations in the form of questionnaires to grade IX teachers who had science lessons. . The needs analysis is also obtained from a questionnaire of students related to online learning in the form of googleform. There are 2 meetings in *Discovery Learning*. The first meeting begins with a pretest. Pretest is done using *google pretest form*. Then continued *stimulation* in the form of video making props solar system (stimulation / stimuli), *problem statement* (statement / identification of problems) by using LKPD Solar System Online, data *collection* (data collection) by determining the tools of making solar props by students, *data processing* (data processing) is done as a task at home by giving the task of making props in the form of videos that will be in apload to the youtube account.The last meeting was *verification* (proof) by showing the results of video making solar props online, generalization (generalization / drawing conclusions), evaluation process (sixth syntak) and postes using *google form* postest.

The research instruments used are questionnaires and tests. The material used is the Solar System. The type of question used is a multiple choice question with a total of 20 questions. The test is given to students with a total of 15 students using *google pretest* form and postes. The purpose of the questioning is to know theimprovement of the learning outcomes of learners. This is obtained from the value of pretes and postes. Research data analysis technique is to use quantitative analysis. Data in the form of values and analyzed using formulas. To determine the results of students' study individually can be calculated by using the following formula.

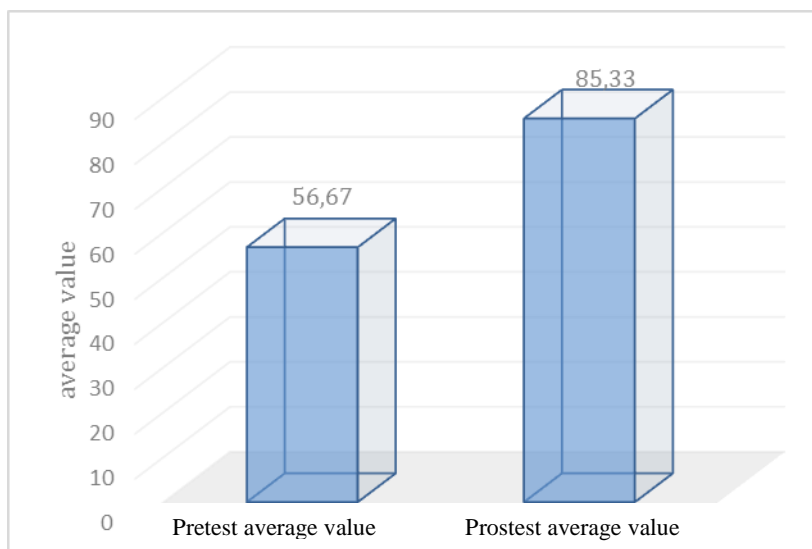
$$\text{Individual value} = \frac{\text{number of indicators achieved}}{\text{the sum of all indicators}} \times 100$$

To find out the improvement of student learning outcomes through the application of discovery learning,the t test with SPSS (Fauziyah, 2016). This is with H0: no difference in pretest and postes results, H1: there is difference in pretest and postes results.

## RESULT AND DISCUSSION

### Result

The cognitive learning outcomes of learners can be seen from the value of pretes and postes. Pretest value is the value before treatment that is the application of discovery learning and postes value that is the value after treatment. Differences in students' cognitive learning outcomes can be seen in Figure 1



**Figure 1.** Difference in Average Pretest and Postes Values

Based on **Figure 1** shows that the learning outcomes of learners increased with an average grade score of 56.67 to 85.33. The score is obtained from the total number of students divided by the number of students. From the average score, all students' learning outcomes increased. there are even 45 points from the pretest value of 55 to 100. The improvement of the test results was obtained from the understanding of learners related to the concept of differences in traits between planets and planetary size. This distinction is made in the form of a question by choosing a multiple choice answer with the time limit determined by the teacher. The test results of the students can not be separated from the props they made by using LKPD Solar System Online, the truth of the concept determines the posttest results of learners.

Once known the average value of pretes and posttest, then conducted a test *paired sample t test* through the SPSS program. Uji *paired sample t test* is used to determine the difference in the value of pretes and postes. The difference in the value of pretest and postes can be known the manufacture of solar system props can improve the cognitive learning outcomes of learners or not. Paired t-test is one of the hypothetical testing methods where the data used is paired. Even using the same subjects, researchers still obtained 2 kinds of sample data, namely data from the first treatment (pretes) and data from the second treatment (postes) (Montolalu & Langi, 2018). The basis of decision making, if  $sign < 0.05$  then there is a significant difference, if the result of  $sign > 0.05$  then vice versa. Based on the results of the t test in the table above, it can be decided that there is a difference between pretes and postes. The following are the test results *paired sample t test* using SPSS. The test results *of paired sample t test* can be seen in **Table 1**.

**Table 1.** The Test Results of Paired Sample t Test

	Paired Differences				t	df	Sig.(2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pair 1	Pretest - Postest	-26,66667	13,58395	-34,18921	-19,14412	-7,603	14	,000

Based on **Table 1** it is obtained that  $Sign < 0.05$  is 0.000. It can then be stated that there is a significant difference between the pretest and postes values. In other words, there is an increase in student

learning outcomes after the implementation of discovery learning through the manufacture of solar system props.

### **Discussion**

The average score above that all students' learning outcomes increased. There are even 45 points from the pretest value of 55 to 100. The test results of the students can not be separated from the props they made by using LKPD Solar System Online, the truth of the concept determines the posttest results of learners. LKPD Solar System supports discover learning learning that students find their own solar system concept by making solar system props. This is in accordance with the opinion of (Sholihah, F., & Prihatiningtyas, 2021) that *discovery learning* helps students to increase students' creativity and improve cognitive learning outcomes. The results of this con contive study can not be separated from the understanding of students when doing props making activities. In addition to helping to improve cognitive learning outcomes, the utilization of science and technology today, especially the main youtube, is needed because it can help utilize the surrounding environment in the right way. One of them, reducing the use of paper as a book in learning. In other words, learning will also continue with the concept of *Paperless* learning (Anantyartha & Sholihah, 2020).

Setyaningrum, at al(2015) explained that learning not only requires students to make direct observations innature, but also hones the skills of studentsin making complex solar system materials easy to understand, among others can be realized in the form of props. In line with Meishanti, et al (2020) that discovery learning model in addition to being able to remind the results of learning, can also train the skills of the student process. Skills learned in discovery learning situations in some cases, younger are transferred for new activities and applied in new learning situations, especially in the form of solar system props (Anjani & Hamdani, 2018).

### **CONCLUSION**

The cognitive learning outcomes of learners increased from an average score of 57.67 to 85.33. This increase is due to the learner's understanding of the differences in characteristics and sizes between planets increased. Based on the results of the test t using SPSS, obtained  $\text{Sign} < 0.05$  which is 0.000. It can then be stated that there is a significant difference between the pretest and postes values. In other words, there is an increase in student learning outcomes after the implementation of discovery learning through the manufacture of solar system props.

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