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The Influence of Powerpoint-Based Discovery Learning Models on Biology Student Learning Outcomes

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Abstract

This study aims to determine the effect of the Power Point Based Discovery Learning learning model on the learning outcomes of biology students on the circulatory system material in humans at MAS PP Nurul Huda Bangai. The research method used is quantitative research in the form of Quasy Experimental Design using a pretest-posttest control design. The Power Point-based Discovery Learning learning model is taught in class XI-A and the conventional learning model is taught in class XI-B. The instrument used in this study was a multiple choice test for student learning outcomes. The data analysis technique used in this study is the Mann-Whitney technique using the SPSS 23.0 for Windows program. The results showed that there was an effect of the Power Point-Based Discovery Learning learning model on the learning outcomes of biology students (P=0.000<0.05), with the average score and standard deviation of the posttest in the Discovery Learning class 77.97 ± 10,848 and the average value and the posttest standard deviation in the conventional class was 69.82 ± 5.348. The results of this study are expected that teachers can apply the Power Point-Based Discovery Learning learning model when teaching the circulation system material in humans to improve student learning outcomes.

Keywords: Powerpoint, Discovery Learning, Biology, Learning Outcomes

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INTRODUCTION

Education is one of the determinants of success in building efforts to increase quality human resources. Education has an important role (Raja & Nagasubramani, 2018) in improving the quality of human resources, education in Indonesia is expected to prepare students to become citizens who have a strong and consistent commitment to the principles and spirit of nationalism in the life of society, nation and state based on Pancasila and the 1945 Constitution (Yusfita et al., 2017). In order for the implementation of education to take place as expected, it is necessary to get serious attention to learning nationally (Hu, 2005).

Learning, especially biology, is learning that emphasizes providing direct experience. Therefore, students need to be helped to develop a number of process skills so that students are able to explore and understand the natural surroundings. Improving student learning outcomes in learning biology subjects can be obtained through a series of planned learning activities. Based on the results of the Program for International Student Assessment (PISA) from 2000 to 2018 it showed a decline in the field of science (fig. 1).

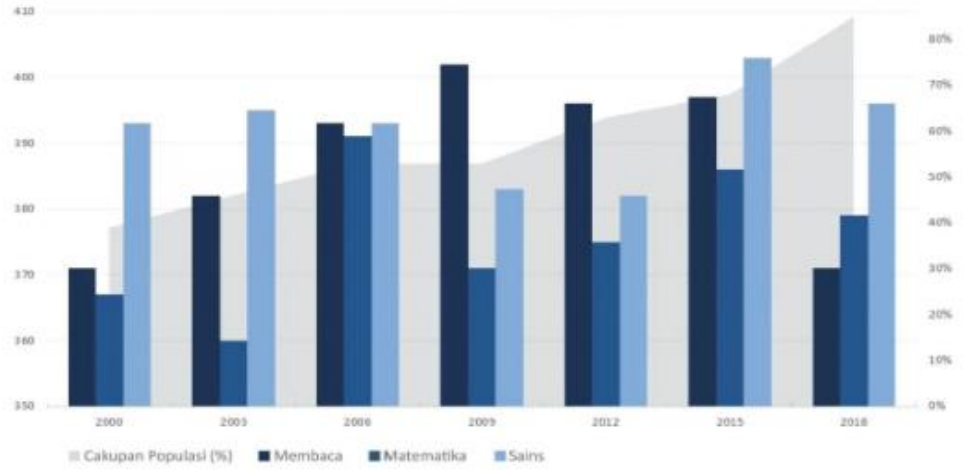

Figure 1. PISA scores in Indonesian reading, mathematics, and science in seven PISA rounds
(Source: Adoption from the Ministry of Education and Culture Research and Development Center for Educational Assessment, 2018)

The low score of the acquisition of Indonesian students reflects the low learning achievement of science (Stacey, 2011). These results also indicate that the average Indonesian scientific ability has only reached the ability to remember and recognize scientific knowledge based on simple facts but has not been able to communicate and relate various scientific topics, let alone apply complex and abstract concepts in everyday life. in accordance with learning biology. The description of the average science based on that obtained by PISA is 396 points in 2018. In the field of science, although it is lower than the 2015 PISA achievement of 402 points, the average score of Indonesian students in PISA 2018 is the second highest in the entire period of PISA implementation. In PISA 2018, Indonesia obtained an average score of 396 in the field of science, 3 points higher than the results of the first PISA in 2000. The lowest average score in the field of science was obtained in PISA 2012, amounting to 382 points. (Kemendikbud, 2018)

Learning is a process of teaching and learning activities that also play a role in determining the success of student learning. From the learning process there will be a reciprocal activity between the teacher and students to get to a better goal (Ratnasari, 2019). The learning process can take place because of the existence of students, teachers, curriculum, one another and are interrelated and interconnected. Students can learn well if the facilities and infrastructure for learning are adequate, if the teacher's learning model is less attractive, these students will be bored and feel bored following learning in class. Improved learning outcomes are not only supported by the willingness of students to want to learn well, but the learning model used by teachers also affects student learning outcomes.

The low learning outcomes of students in schools really need to be considered by teachers (Bakkenes, Vermunt, & Wubbels, 2010; Lingo, Barton, & Jolivette, 2011; Sudargini & Purwanto, 2020). The success of the learning process is something to be achieved in carrying out an education in schools, so that the process is successful it is necessary to have a pleasant teaching and learning atmosphere and environment as well as

active student involvement in every learning activity carried out. With the involvement of students in each learning process, the material presented by the teacher is more easily accepted and understood by students and can be stored in long-term memory (long time memory). Student learning outcomes are used as benchmark criteria in achieving a goal of good quality education in the future. In this case the learning outcomes are the results achieved by students after going through the learning process within a certain time which is measured using an evaluation tool.

Based on observations made at MAS PP Nurul Huda Bangai showed that the biology learning outcomes of students in class XI were less than optimal, the average student learning outcomes only reached a value of 65. This value did not meet the specified KKM of 75. This was due to several factors, namely learning models that are less varied, still use conventional methods or lecture methods, and use less learning media because based on the initial observations of researchers at the school, teachers teach only using books without the help of other learning media. In addition, the learning process at the school during the current Covid-19 pandemic has also become shorter due to a reduction in lesson hours. This is because the school implements health protocols based on instructions from the government, such as reducing class hours, the number of students in one class which is divided into 2 shifts and various other health protocols government instructions by complying with the 5 M, namely washing hands, wearing masks, maintaining social distance. , stay away from crowds and reduce mobility.

From some of these factors, students sometimes feel bored and bored to participate in the learning process and do not trigger student activity so that it has an impact on student biology learning outcomes. Because they feel bored, sometimes students are less interactive when the teacher asks whether they understand or not with the material that has been explained by the teacher. To overcome various weaknesses in the learning process, in delivering lessons can be done using various methods and learning models so as to make it easier for students to understand the learning delivered. In the learning process, it is necessary to have learning activities that can increase student learning activities and outcomes. One of the learning models that are expected to be used effectively is the application of the Discovery Learning learning model (Fitriyah, 2017).

The rapid development of science and technology today requires a country to improve the quality and quality of education in order to be able to compete with countries in the world (Kosilah & Septian, 2020). There are many learning media that can be used by teachers to deliver learning at this time, from print to electronic media, including using Power Point media (Misbahudin et al., 2018). The Discovery Learning learning model can be better if it is combined with Powerpoint (PPT) media. Media Powerpoint (PPT) combined with the Discovery Learning learning model can make students learn actively, process-oriented, self-directing so as to make students able to increase their confidence in expressing their own opinions as a basis for proving whether or not the hypothesis that has been determined from the results processing and interpretation that has been formulated (verification) (Putrayasa, 2014). Media Program Microsoft Power Point is a presentation application program that is popular and most widely used today for various presentation purposes in the learning process (Tohari, 2021)

The stages of the discovery learning learning model starting from stimulation, problem identification, data collection, data processing to the evaluation stage carried out by students in the learning process applied in PPT media are suitable for circulation system material. According to research by Khairiyah (2016) also states that the use of the Discovery Learning learning model with PPT media can improve student biology learning outcomes in the affective, cognitive and psychomotor domains. Through the Discovery Learning model, student activity is optimized in the learning process, through discoveries to gain knowledge independently or in groups. The students' learning process applies a

series of scientific work including critical thinking skills, analysis and logical thinking skills so that students get a deeper and more meaningful impression of what they are learning.

METHOD

This research was conducted at MAS PP Nurul Huda Bangai, Torgamba District, South Labuhanbatu Regency, North Sumatra Province. According to Sugiyono (2017) "Population is defined as a generalization area consisting of: Objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions". The population in this study were all students of class XI which consisted of class XI A and class XI B. The samples used in this study were 2 classes with a total of 57 students using purposive sampling technique. This research is a type of quantitative research. The independent variable is the Powerpoint-Based Discovery Learning learning model. The dependent variable is learning outcomes. This research design uses the form of Quasy Experimental Design where the researcher cannot control all external variables that affect the course of the experiment, with the research design using Pretest-posttest control design giving pretest at the beginning and giving posttest at the end, conducting research in the experimental class and control class to determine learning outcomes. students after being given different treatment.

Tabel 1. *Pretest-posttest control design*

Class	Pre-test	Treatment	Post-test
Experiment	A1	P1	A2
Control	B1	P2	B2

Description:
A1: Pretest on experimental treatment
B1: Pretest on conventional treatment
P1: Use of Powerpoint-based Discovery Learning learning model
P2: Use of conventional learning

Descriptive analysis technique is intended to describe research data including mean, median, mode, variance, standard deviation, minimum value and maximum value of data (Hasmi Syahputra Harahap, 2021). The data normality test determines whether the distribution of data in a study is normal or not, namely whether the distribution of data in the population is normal. Normality test was carried out by Kolmogrov-Smirnov test. The homogeneity test of the data is intended to determine the difference in the variance of the data from the population.

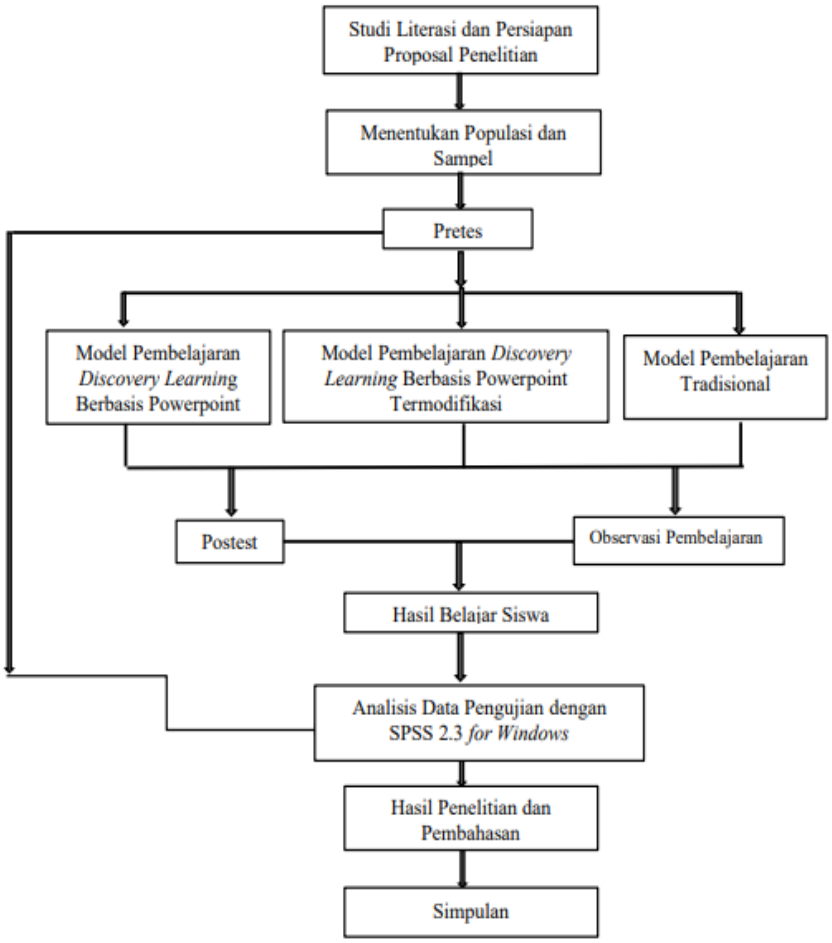

Figure 1. Research Map

RESULTS & DISCUSSION

In this study, the test was carried out twice, namely the pretest was conducted to determine the students' initial abilities before the learning process was carried out by applying the Power Point-Based Discovery Learning learning model, and the final test (posttest) was conducted to determine the learning outcomes after applying the learning model. Power Point Based Discovery Learning. The form of the test used is an objective test in the form of multiple choice with 30 questions. With the difference in scores between the pretest and posttest, it can be stated that the application of the Power Point-Based Discovery Learning model can improve student learning outcomes.

The average value and standard deviation of the students' pretest in the Power Point-Based Discovery Learning model class is 41.00 ± 20,588 and the average score and standard deviation of the posttest in the conventional model class is 37.39 ± 15.550. The average score and standard deviation of the students' pretest in the Power Point Based Discovery Learning model class is 77.97 ± 10,848 and the average score and standard deviation of the posttest in the conventional class is 69.82 ± 5,348.

The results of testing the normality of the data on the pretest and posttest of student learning outcomes from each class of Discovery Learning and Conventional learning

models indicate that the distribution of the data is not normally distributed (P <0.05) it is analyzed using nonparametric tests. Then, the results of the homogeneity test of the pretest data on student learning outcomes were declared not homogeneous (P = 0.002 <0.05). Hypothesis research was conducted using the Mann-Whitney technique for data on student learning outcomes based on pretest and posttest.

The results of Mann-Whitney using SPSS show that the Discovery Learning learning model has a very significant effect on student learning outcomes with an average value of 77.79 using the Power Point-Based Discovery Learning learning model and an average value of 69.82 using the conventional learning model.

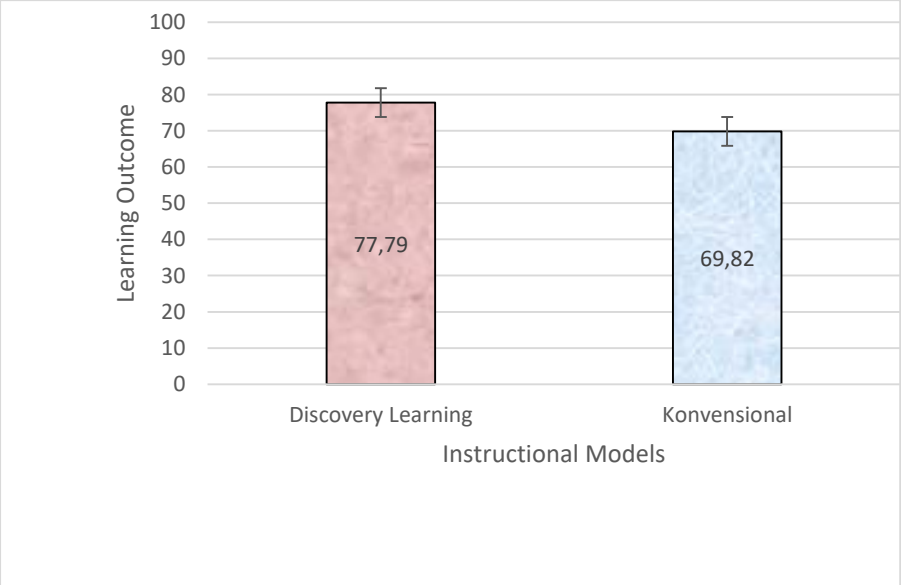

Figure 2: The Effect of Learning Models on Student Learning Outcomes of Class XI MAS PP. Nurul Huda Bangai (P=0.000<0.05).

Based on the average value of student learning outcomes, it shows that the Discovery Learning learning model is very influential on student learning outcomes.

Based on the results of the research test, it was obtained (P = 0.000 <0.05). Thus, the Discovery Learning learning model greatly influences student learning outcomes. This is in accordance with research (Medianty et al., 2018) concluding that the application of the Discovery Learning learning model is increasing. By using video media in class XI IPA 1 SMA N 01 Bengkulu City is able to increase teacher activity seen from the average score in each cycle which reaches a good category, namely cycle 1 of 26.5, in cycle II of 27.5 and 33 in cycle III. The application of the Discovery Learning learning model using video media in class XI IPA I SMA N 0I Bengkulu City was able to increase students' chemistry learning activities seen from the average score in each cycle, namely in the first cycle of 22.5 (enough), in the second cycle of 25 (good), and in the third cycle 27 (good). Likewise, the research that has been carried out (Azhari, 2015), regarding the application of the Discovery Learning learning model, concluded that there was an increase in student learning outcomes in the respiratory system material for class XI IPA 1 SMA Negeri Unggul Sigli. This statement is evidenced from the results of the basic score to cycle 1 and cycle II, which has changed. The average activity in cycle 1 was 22, 67%, increasing to 75.32% in cycle II. The number of students who met the KKM increased from 3 (12.00%), to 11 (44.00%) and 23 (92%) students. The achievement of classical learning outcomes has

exceeded 85% in the second cycle. This condition shows that student learning outcomes have been categorized as high. Based on the results of research conducted (Puspitasari & Nurhayati, 2018) which is regarding the application of the Discovery Learning learning model through lesson study and students who are taught conventional learning models to fifth grade elementary school students in Cluster x Buleleng District, Buleleng Regency for the 2017/2018 academic year. It is known that the average score of the experimental group learning outcomes is 23.74 while the control class is 19.50 this means that the average score of the experimental group learning outcomes taught by the Discovery Learning learning model through lesson study is higher than the average score. control group learning outcomes. So that the learning model of Discovery Learning through lesson study has an effect on students' science learning outcomes.

The teacher as one of the elements in the teaching and learning process has an important role, namely as a teacher who transfers knowledge and as a mentor who encourages students' potential in learning. teaching techniques, and displaying a personality capable of being a role model for students (Firmansyah, 2015). Learning outcomes are changes in behavior or competencies (attitudes, knowledge, skills) obtained by students after going through learning activities. Learning outcomes according to Winkel in Duda (2018) are "Changes that cause humans to change in their attitudes and behavior. According to Hosnan in Astuti (2018), learning the Discovery Learning model is a model for developing active student learning by discovering and investigating on their own, so that results will be obtained that will last a long time in memory and are not easily forgotten by students. With this technique students are left to find themselves or experience their own mental processes, the teacher's role is only to guide and provide instructions. The Powerpoint Media (PPT) used can help students find out more information about the learning media that is being presented and the objects displayed look concrete (real) with the features presented (Khairiyah, 2016). This proves that the implementation of learning using the Power Point-Based Discovery Learning model can improve student learning outcomes.

CONCLUSION

Based on the results of the research and discussion that have been described, the conclusion in this study is that there is a very significant learning effect from the use of the Discovery Learning and Conventional learning models on student learning outcomes in the circulation system material in humans at MAS PP Nurul Huda Bangai.

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