Differences in Learning Outcomes Using Discovery Learning and Problem-Based Learning Models on Indonesia's Strategic Position as The World's Maritime Axis

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Abstract: Discovery Learning is a model that invites students to actively learn to discover their knowledge. Meanwhile, Problem-Based Learning is a learning model where students are required to be active in acquiring concepts by solving problems. This research aims to analyze geography learning outcomes using the discovery learning model; determine the results of learning geography using the problem-based learning model; determine differences in geography learning outcomes using discovery learning models and problem-based learning models. The research method used was a quasi-experiment with two classes, namely the experimental class and the control class. Based on the research results, the learning outcomes for class XI IPS 1 were obtained with an average score of 85.8, and the learning outcomes for class learning on geography learning outcomes in class.

Keywords: Discovery; Maritime axis; Problem-based learning; World

Introduction

Education plays a major role in becoming a benchmark for advancing a nation. In this way, education is an effort to increase human resources that can compete in the current era of globalization. According to Persada (2016), education is a complex event that involves several components, including: goals, students, teachers, content (teaching materials), methods (methods) and situations (environment). Of the six components above, the one that can support success in the learning process is the teacher, where a teacher in carrying out a learning process uses the right learning model to achieve the expected learning goals (Angga et al., 2022). Discovery Learning is a model that invites students to actively learn (Al Hakim et al., 2018; Clements & Joswick, 2018) to discover their own knowledge, and this will make students feel challenged and interested in identifying problems with an experiment (Jatisunda et al., 2020; Usman et al., 2022), so

that students will feel interested in understanding the material and mastering thematic learning material (Irawan et al., 2017).

The Discovery Learning model has six main steps in the learning stage, namely: Stimulation (providing stimulation), problem statement (problem identification), data collection (data collection), data processing (data processing), verification (proof), and generalization (concluding) (Hanifah, 2017; Hendrizal et al., 2022; Putri, 2020). The advantages of the Discovery Learning model according to Suherman et al. (2022), namely that students are active in learning activities because they think and use their abilities to find the final result, students understand the learning material, because they experience the process of finding it themselves (Sahara et al., 2020), finding it themselves can create a sense of satisfaction, this inner satisfaction encourages them to make more discoveries so that their interest in learning increases, students who gain knowledge using the discovery method will be better

able to transfer their knowledge to various contexts, and this method trains students to learn more on their own (Hayati, 2023; Lutfian, 2023; Tyas et al., 2020).

Meanwhile, according to Kurniasih (2012), the weakness of the Discovery Learning model is that this method creates the assumption that there is a readiness of mind to learn, for less intelligent students will have difficulty thinking or expressing the relationship between concepts, written or verbal so that in turn it will lead to frustration, this method is inefficient, this method is not efficient for teaching large numbers of students, because it takes a long time to help them find theories for solving other problems, the hopes contained in this method can be shattered when faced with students and teachers who are accustomed to old ways of learning, discovery teaching is more suitable for developing aspects of concepts, skills, and emotions. As a whole, less attention is given, in some disciplines, for example, science, there is a lack of facilities to measure the ideas put forward by students, and does not provide opportunities for thinking that students will find because they have been selected in advance by the teacher (Erwinsyah, 2017).

Through problems presented by the teacher, students use their scientific reasoning abilities to develop an experiment which includes the ability to formulate problems, create hypotheses, determine variables, design experiments, analyze data, and make conclusions based on data. The Problem-Based Learning model has 5 main steps in the learning stage, namely orienting students to the problem, organizing students to learn, guiding individual and group investigations, developing and presenting work results, and analyzing and evaluating the problem-solving process (Saifulloh & Darwis, 2020).

Apart from that, the Problem-Based Learning model has advantages and disadvantages. The advantages of the Problem-Based Learning model according to Sanjaya (2014), namely that it challenges students' abilities and provides satisfaction in discovering new knowledge for students, increases students' learning activities, helps students how to transfer their knowledge to understand problems in real life, and stimulate the development of students' thinking progress to solve the problems they face quickly. Meanwhile, according to Sanjaya (2011), the weaknesses of the Problem-Based Learning model are that it requires complex learning preparation (tools, problems, concepts), it is difficult to find relevant problems, frequent miss conceptions occur, and it requires quite a long time in the investigation process (Junaidi, 2019; Lestari, 2020; Siswanti & Indrajit, 2023; Wahyuni, 2018). The objectives of this research are: Analyze geography learning outcomes using the discovery learning model; To find out the results of learning geography using the problem-based learning model; To determine differences in geography learning outcomes using discovery learning models and problem-based learning models.

Method

The data collection technique used in this research was carried out by observation, namely by using primary data obtained through interviews and observations at schools with teachers who can provide information related to the problem being researched and used to directly observe how the students' learning process occurs in the school. class. The technique used is to use a test, namely a pretest at the beginning of the learning process and a posttest at the end of the learning process to find out what the student's learning outcomes are after using the Discovery Learning model and the Problem-Based Learning model (Mamondol, 2021; Nasution, 2019; Wahyuning, 2021).

Assess the test results obtained from the two treatment groups, namely the group that used the Discovery Learning model and the Problem-Based Learning model (Doyan et al., 2021; Setyaningrum et al., 2020; Suniasih, 2021). Next, the data that has been obtained is then analyzed to create a research report. The data analysis used in this research is quantitative analysis, after giving treatment to the Discovery Learning class and the Problem-Based Learning class, then giving a final test (posttest) to both classes, both the Discovery Learning class and the Problem-Based Learning class (Agustin & Winanto, 2023; Prasetyo & Kristin, 2020). The results of this posttest are considered as data entered into the existing table.

Result and Discussion

Research result

Based on the results at the beginning (pretest) and results at the end (posttest) obtained by students in class XI IPS 1 who used the Discovery Learning learning model, namely

Table 1. Recapitulation of Discovery Learning Pretest Learning

Value	Description	F	P (%)
80-100	Very good	0	-
70-79	Good	0	-
60-69	Fair	2	7.14
50-59	Less	12	42.86
0-49	Very little	14	50.00
		N = 28	100.00

Table 2. Posttest Recapitulation of Discovery Learning

Value	Description	F	P (%)
80-100	Very good	28	100
70-79	Good	0	-
60-69	Fair	0	-
50-59	Less	0	-
0-49	Very little	0	-
		N = 28	100

Problem-based learning

Based on the results at the beginning (pre-test) and results at the end (post-test) obtained by students in class XI IPS 2 who used the Problem-Based Learning model, namely.

Table 4. Summary of pre-test problem-based learning

Value	Description	F	P (%)
80-100	Very good	0	-
70-79	Good	0	-
60-69	Fair	4	13.33
50-59	Less	16	53.34
0-49	Very little	10	33.33
		N = 30	100.00

Table 5. Posttest summary of problem-based learning

Value	Description	F	P(%)
80-100	Very good	29	96.67
70-79	Good	1	3.33
60-69	Fair	0	-
50-59	Less	0	-
0-49	Very little	0	-
		N = 30	100.00%

Differences in Learning Results Using Discovery Learning and Problem-Based Learning
Average Discovery Learning Outcomes

Based on the research results, the pre-test results obtained an average of 52.78 with a minimum value of 35 and a maximum value of 63. Then the post-test results obtained an average of 85.54 with a minimum value of 80 and a maximum value of 92, a standard deviation of 4.24 Thus, the results of class learning using the Discovery Learning model are in the good category.

Average Problem-Based Learning Results

Based on the research results, the pre-test results obtained an average of 56.22 with a minimum value of 47 and a maximum value of 69. Then the post-test results obtained an average of 90.1 with a minimum value of 89 a maximum value of 100, and a standard deviation of 3.32. Thus, the results of class learning using the Problem-Based Learning model are in a good category. Based on the criteria for the average value of Geography learning outcomes for classes XI IPS 1 and XI IPS 2 is used to see the difference in the average pre-test and post-test scores for classes using the Discovery Learning

model and the Problem-Based Learning model, so it can be seen as follows:

Table 6. Differences between Pre-test and Post-test

Class	Pre Test	Post Test
XI IPS 1	52.78	85.54
XI IPS 2	56.22	90.1

Discussion

This research was conducted at SMA Negeri 2 Nunukan by taking a sample of two classes that had been tested and had homogeneous abilities. In this study, researchers used two samples, namely Class XI IPS 1 as a class that used the Discovery Learning model and Class XI IPS 2 as a class that used the Problem-Based Learning model. In this way, data on differences in research results can be obtained as follows:

Learning Results of the Discovery Learning Model

Based on the results of research conducted by researchers and from the results of data analysis, the pre-test average score for class XI IPS 1 students who used the Discovery Learning model was 52.78. Meanwhile, the results of post-test data analysis for the average value of learning outcomes for class In the end, students as a whole have maximally accepted the material presented by the teacher.

Based on the results of observations in class carrying out assignments from the teacher to search for themselves and investigate for themselves the main problem at hand. The Discovery Learning learning model is a discovery learning model where students are trained to solve a problem themselves for which the teaching material has been presented by the teacher so that students are trained to think more actively to find new knowledge and investigate it in their way without having to explain it to the teacher in front of the class. This is by research by Kawuri & Fayanto (2020); Risnawati et al. (2022); Safitri et al. (2022) which states that by using the Discovery Learning model student learning outcomes are better because students are required to be more active during the teaching and learning process. Students carry out group discussions and try to find solutions to problems given by the teacher, as well as to understand the structure or key ideas.

Learning Results of the Problem-Based Learning Model

Based on the results of research conducted by researchers and the results of data analysis, the pre-test average score for class XI IPS 2 students who used the Problem-Based Learning model was 56.22. Meanwhile, the results of post-test data analysis for the average value of learning outcomes for XI IPS 2 class which uses the Problem-Based Learning model is 90.10, which

shows that students' overall final knowledge has been maximized in accepting the material presented by the teacher.

Based on the results of observations in class asking a question to solve a problem students seem active in answering questions from the teacher to solve a problem that exists in the real world. The Problem-Based Learning Model is a learning model based on problem-solving that can be linked to real-world problem-solving. In problem-based learning, it is hoped that students can solve problems through the real world so that students' thinking abilities can be optimized to form new knowledge and experiences.

This is by research by Irawan et al. (2017) which suggests that the average value of experimental class-1 (Problem Based Learning model) and experimental class-2 (Direct Instruction learning model) can be concluded that the Problem Based Learning model is better than the learning model. Direct Instruction in improving student learning outcomes. Differences in Geography Learning Outcomes Discovery Learning and Problem-Based Learning at SMA Negeri 2 Nunukan.

Based on the two-sample t-test, it can be seen from the results of data analysis with a significance level (α = 0.05) the value of $t_{count} > t_{table}$ (2.833 > 1.671), then as is the basis for decision making in the two-sample t-test it can be concluded that H_0 is rejected and H_α accepted. Thus, it can be concluded that there is a significant difference between the average learning outcomes of students using the Discovery Learning model in class XI IPS 1 and the Problem-Based Learning model in class with an average value of 90.1.

This increase in learning outcomes is seen and proven during the learning process, almost all students follow and pay attention well, this is because in learning using the Discovery Learning model students are required to learn actively in investigating and finding the main point of a problem for themselves (Damanik et al., 2023; Mukin et al., 2024). This is by Persada (2016) research that students' responses to the discovery learning model were very good. Apart from that, Efendi (2012) also stated that the average mathematics learning outcomes of students who used discovery learning methods were better than the average mathematics learning outcomes of students who used conventional learning methods.

The Problem-Based Learning model received a lower average score of 85.54 compared to the Discovery Learning model because when learning the Problem-Based Learning model several things influenced the learning process, whereas class XI IPS 2 used This model when the teaching schedule in class interspersed with rest time so that when the next schedule comes, some students are still outside the classroom and are late coming in so that some students who are late coming in

can be disturbed by the presence of some students who are late coming in and cannot create an atmosphere conducive class.

Based on observations during the research, learning using the Problem-Based Learning model was able to attract students' attention to pay attention to the lesson material presented by the teacher (Ulimaz et al., 2023), students became more active in asking questions. so that students and teachers can enjoy the teaching and learning process (Abdurahman et al., 2023; Halim et al., 2020). The use of the Discovery Learning model does not attract students' attention, so students experience difficulties when learning, working in groups to find solutions to the problems given.

Conclusion

Based on the research results presented in the previous chapter, in this study several conclusions are put forward which are answers to the hypothetical questions formulated in this research, namely, the results of students' geography learning in class XI IPS 1 SMA Negeri 2 Nunukan (Material on Indonesia's Strategic Position as World Maritime Axis) using the Discovery Learning model received a good category with a post-test score of 85.54. The use of the Problem-Based Learning model received a good category with a post-test score of 90.1. The Problem-Based Learning (XI IPS 2) learning model can be seen from the value of $t_{count} > t_{table}$ (2.833 > 1.671) with a significance level (α = 0.05).

Author Contributions
This article was prepared by single author i.e T.A.P.

Conflicts of Interest
The authors declare no conflict of interest.

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