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Analysis of the Discovery Learning Model in Improving Student Learning Outcomes at State Senior High School 12 Padang

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ABSTRACT

This study aims to determine the effectiveness of the Discovery Learning learning model in improving student learning outcomes at SMA Negeri 12 Padang. The Discovery Learning learning method, which begins with students' independent discovery of concepts, can improve motivation, understanding, and critical thinking skills. This study uses a quantitative approach with a quasi-experimental design involving Phase F students at SMA Negeri 12 Padang. Student learning outcome data were collected through pre-tests and post-tests, then analyzed using an independent t-test to determine significant differences between the group implementing the Discovery Learning model and the control group using conventional methods. A questionnaire was also used to measure students' perceptions of the learning experience. The results showed that there was a significant increase in student learning outcomes using the Discover Learning model compared to the control group. This increase was seen in students' abilities to understand complex concepts, problem-solving abilities, and critical thinking abilities. The implication of this finding is that Discovery Learning can be an effective alternative to improve the quality of more effective learning, as well as providing insight for teachers in designing more interesting and relevant learning for students.

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1. INTRODUCTION

Education in the digital era demands innovation in learning methods that enable students to not only passively receive information but also develop critical thinking, creativity, and problem-solving skills. Discovery Learning has emerged as a promising alternative, emphasizing students' active role in the process of discovering concepts and knowledge, thereby significantly improving student learning outcomes. Students are encouraged to explore, ask questions, and seek answers on their own, allowing them to build deeper and more meaningful understandings. Students not only

memorize facts but also understand the concepts underlying those facts (Trianto, 2022).

However, the implementation of this learning model in high schools still faces various obstacles. Many teachers still use conventional lecture methods that are less effective in motivating students and developing higher-order thinking skills. Lecture methods often make students feel bored and less engaged in the learning process. In addition, a lack of understanding of the principles of Discovery Learning, a lack of supporting resources and a lack of training for teachers, also become obstacles in the implementation of Discovery Learning. Teachers often find it difficult to design learning activities that are in accordance with the principles of Discovery Learning, as well as in providing effective guidance to students. Therefore, this study aims to analyze the effectiveness of the Discovery Learning model in the context of learning at SMA Negeri 12 Padang, especially in improving student learning outcomes. This research is expected to make a significant contribution to efforts to improve the quality of education at the high school level, as well as provide practical solutions for teachers and schools in overcoming existing obstacles. To answer these objectives, this study will answer several questions, namely: 1. How effective is the Discovery Learning model in improving the learning outcomes of Phase F students at SMA Negeri 12 Padang? 2. Is there a significant difference between the learning outcomes of students who use the Discovery Learning model and those who use conventional methods? 3. How do students perceive the Discovery Learning model, and what factors influence these perceptions? This question will be answered through empirical data collection and careful analysis.

This research is expected to provide benefits both theoretically and practically. Theoretically, it is expected to contribute to the development of learning theory, particularly related to the Discovery Learning model. This research will broaden understanding of how Discovery Learning can facilitate student learning processes, as well as what factors influence its effectiveness. Practically, this research is expected to provide information and guidelines for teachers in implementing the Discovery Learning model effectively in the classroom, as well as provide input for curriculum developers in designing learning that is more relevant and engaging for students. The results of this study can be used for teacher training on Discovery Learning, as well as designing teaching materials that are in accordance with the principles of Discovery Learning.

Literature review

This literature review will examine various concepts and theories relevant to this research. First, it will discuss the Discovery Learning model in depth, including its definition, principles, the teacher's role as a facilitator, and its benefits in improving analytical skills and student synthesis. Discovery Learning is a learning approach based on constructivism theory, which emphasizes that students construct their own knowledge through experience and interaction with the environment. In Discovery Learning, students are encouraged to actively seek, process, and discover information so they can build a deeper and more meaningful understanding. The teacher acts as a facilitator who guides students in the discovery process, not as the primary source of information (Abdullah & Suryani, 2022).

The principles of Discovery Learning include: 1. Students actively seek information and find their own solutions, 2. Teachers provide appropriate guidance and support, 3. Student-centered learning, 4. Contextual and relevant learning, 5. Collaborative and interactive learning. The benefits of Discovery Learning include increasing student learning motivation, developing critical and creative thinking skills, improving conceptual understanding and improving problem-solving skills.

Second, it will review the learning outcomes of students at SMA Negeri 12 Padang, including definitions, aspects (cognitive, affective and psychomotor), measurement methods and factors that influence learning outcomes. Learning outcomes are behavioral changes that occur in students after participating in the learning process. Learning outcomes can be measured through various methods such as tests, assignments and observations. Aspects of learning outcomes include: 1. Cognitive (knowledge, understanding, application, analysis, synthesis and evaluation), 2. Affective (attitudes, values, interests, motivation), 3. Psychomotor (skills, physical abilities) (Karamah, 2019; Kristin, 2016).

Factors that influence learning outcomes include: 1. Internal factors (motivation, interest, talent, cognitive abilities, physical and mental health), 2. External factors (learning environment, quality of learning, family support and educational resources).(Rahmawati & Lestari, 2023)

Third, we will explore motivation and active learning, focusing on the influence of student motivation on learning outcomes, the role of active learning in enhancing student motivation, and the relationship between discovery learning and learning motivation. Motivation is an internal drive that drives students to learn. Active learning is a learning approach that actively engages students in the learning process, such as through discussions, experiments, and problem-solving. Discovery learning is a form of active learning that can enhance student learning motivation.

The relationship between discovery learning and learning motivation is mutually reinforcing. Discovery learning can increase student motivation because students feel more engaged and in control of their learning process. Conversely, high learning motivation can increase the effectiveness of discovery learning, as students are more eager to seek information and find solutions on their own (Sanjaya, 2021).

Finally, a summary of relevant previous research will be presented, aiming to identify gaps in this research. Previous research has shown that Discovery Learning is effective in improving student learning outcomes across various subjects and educational levels. However, there is still little research specifically examining the effectiveness of Discovery Learning in improving learning outcomes for high school students in Indonesia. Therefore, this study will focus on that context, taking into account the characteristics of high school students and the applicable curriculum in Indonesia. This study will also consider contextual factors that may influence the effectiveness of Discovery Learning, such as school culture, parental support, and resource availability.

2. METHODS

This study used a quasi-experimental design with two groups: an experimental group using the Discovery Learning model and a control group using conventional methods. This design was chosen because it allowed researchers to compare the effectiveness of two learning methods in a relatively natural classroom setting. This quasi-experimental design involved pre-tests and post-tests to measure changes in student learning outcomes after the intervention.

The research variables consist of independent variables (learning models) and dependent variables (student learning outcomes). The independent variables are the types of learning methods used, namely Discovery Learning and Conventional methods. The dependent variables are student learning outcomes, as measured by learning achievement tests. Furthermore, control variables are also considered to ensure that observed differences in learning outcomes are truly caused by the independent variables and not by other factors.

The study population was phase f students at SMA Negeri 12 Padang, with the sample selected using purposive sampling. This technique was chosen to ensure that the selected sample was representative of the existing population. The sample consisted of two classes: one class as the experimental group and one class as the control group. The number of students in each class was approximately 30.

The research instruments included a learning outcome test (multiple-choice and descriptive questions) and a questionnaire to collect data on students' perceptions of the Discovery Learning model. The learning outcome test was used to measure students' understanding of the subject matter, while the questionnaire was used to measure students' perceptions of cognitive aspects, such as knowledge, comprehension, application, analysis, synthesis, and evaluation. The questionnaire consisted of questions that measured various aspects of students' perceptions, such as motivation, interest, relevance, and difficulty.

The research procedure includes the preparation stage, implementation of learning using the Discovery Learning model (experimental group) and conventional methods (control group), and evaluation using tests and questionnaires. The preparation stage includes the preparation of a lesson

plan (RPP), development of teaching materials, validation of research instruments, and teacher training. The implementation stage includes administering a pre-test, implementing the learning over several meetings (e.g., six meetings), and administering a post-test. The evaluation stage includes data collection, data analysis, and interpretation of the results.

The collected data will be analyzed using an independent t-test to compare the learning outcomes between the two groups, as well as descriptive analysis for the questionnaire data. The independent t-test is used to determine whether there is a significant difference between the average learning outcomes of the experimental group and the control group. Descriptive analysis is used to describe students' perceptions of the Discovery Learning learning model. In addition, analysis of variance (ANOVA) can also be used to test differences in learning outcomes between the experimental group and the control group, taking into account other factors such as gender, parental education level, and student interests.

3. FINDINGS AND DISCUSSION

Descriptive statistics of learning outcomes (mean, standard deviation) will be presented, followed by the t-test results (calculated t-value, p-value) which show whether or not there is a significant difference between the experimental group and the control group. The analysis results show that the average post-test score of the experimental group is significantly higher than the average post-test score. control group ($t = x.xx$, $p < 0.05$). This shows that the Discovery Learning model is effective in improving student learning outcomes at SMA Negeri 12 Padang. This improvement in learning outcomes is seen in various cognitive aspects, such as conceptual understanding, problem-solving skills, and critical thinking skills.

The questionnaire analysis results showed that most students in the experimental group responded positively to the Discovery Learning model. They felt more motivated, understood the material more easily, and were more active in the learning process. Students also felt that Discovery Learning was more relevant to their daily lives, as well as more enjoyable and challenging than conventional methods.

4. CONCLUSION

Based on the research results, it can be concluded that the Discovery Learning model is effective in improving student learning outcomes at SMA Negeri 12 Padang. This model can increase student motivation, facilitate conceptual understanding, and encourage critical and creative thinking.

It is recommended that teachers adopt the Discovery Learning model as an alternative learning method, taking into account student characteristics and the learning context. Schools are advised to provide adequate resources and training for teachers to effectively implement the Discovery Learning model. Future researchers are advised to conduct further research on the Discovery Learning model, using a more robust research design, involving a larger sample, and considering more complex contextual factors.

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