

The Effectiveness of Discovery Blended Learning on Concept Understanding and Student Motivation

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Abstract

This study aims to determine the effectiveness of discovery blended learning towards understanding concepts and learning motivation in the material of class VIII human excretion system in SMP Negeri 27 Semarang. This research is an experimental study with a true experimental design type posttest only control group design. Sampling was done by purposive sampling, with each experimental group and the control class. Data was collected using tests, observation sheets, and questionnaire sheets. The results showed that discovery blended learning was effective against the understanding of concepts and learning motivation of VIII grade students in SMP Negeri 27 Semarang which was seen from the percentage of conceptual understanding between the experimental class and the control class, there were significant differences between the average value of the experimental class concept understanding and the control class and the average learning motivation of the experimental class.

Keywords

Discovery Blended Learning, Concept Understanding, Learning Motivation

1. Introduction

One important component of learning is the media. Advances in science and technology, especially information technology, greatly affect the preparation and implementation of learning methods or models. According to Sanjaya (2006), using communication media can not only simplify and streamline the learning process, but can make the learning process more interesting.

Media can be one of the innovations in science learning. Science learning is not just memorizing theories and concepts, but also needs to be applied with the scientific method. This is in accordance with the statement of Zubaidah et al., (2014) that science learning is not only learning about a collection of knowledge in the form of facts, concepts, or principles but also a process of discovery. The discovery process can be carried out in various ways, including observation, exploration and experimentation so that active students and teachers act as facilitators. Science is a science that develops from experience with natural phenomena and the interactions that occur in them. The appropriate method used for science learning is learning that involves students directly, one of which is the Discovery Learning model. Students play a direct role in the learning process in identifying problems, collecting data in the form of relevant information.

Based on the results of observations and interviews at SMP Negeri 27 Semarang with one of the science teachers, information was obtained that students were less interested in learning in the classroom, because there was still a lack of learning innovation in the classroom, resulting in low learning motivation of students. Understanding of the material presented in class has not been thoroughly absorbed and understood by students. So that students still find it difficult to understand science lessons, it can be seen from the results of the assessment of science subjects which are still low below the Minimum Completeness Criteria (KKM) of 75, with a percentage of 55% of all class VIII students who achieve mastery learning.

Discovery learning can train students to improve their understanding of concepts through observing, asking, trying, reasoning, and communicating activities. Through the syntax or learning steps such as the stimulation stage, students are invited to observe, the problem statement stage, students are invited to ask questions and collect information, the data collection stage, students are invited to reason, the data processing stage, students are invited to reason. and asking, the final stage of verification, students are invited to reason and communicate (Kemendikbud, 2013).

Continuity of students' learning can be influenced by students' learning motivation. Learning motivation has a great influence on students' mastery of concepts, because if the material being studied is not in accordance with the learning motivation of students, then students will not learn optimally (Sihaloho, 2013). Based on the results of Herliana's (2015) research, it is concluded that there is an interaction between the blended learning model and learning motivation on student learning outcomes.

The material on the excretory system discusses the structure and function of the organs of the human excretory system which includes the kidneys, skin, lungs, and liver, and abnormalities or diseases in the organs of the human excretory system as well as applying a healthy lifestyle to maintain a healthy excretory system. In this material, students should not only memorize, but in a way that students are directly involved in visually seeing the process of excretion in humans. Based on the description above, this study analyzes the effectiveness of discovery blended learning on understanding concepts and students' motivation for the human excretory system.

2. Methods

This research is an experimental study with a true experimental design type posttest only control group design. The sampling technique is purposive sampling. The sample consisted of

two classes, class VIII-C as the experimental class and class VIII-B as the control class. The research design design pattern can be seen in Table 1.

Table 1. posttest type only control group design.

| Class | Treatment | Test |
|------------|-----------|----------------|
| Experiment | X | O ₁ |
| Control | - | O ₂ |

Information:

X : Learning using the Discovery Blended Learning model

O₁ : Tests in the experimental class after treatment with Discovery Blended Learning

O₂ : Test in the control class after learning with Discovery Learning

Data collection techniques using tests, observations and questionnaires. The observation method is used to determine the learning independence of students during the learning process. The questionnaire method was used to determine the learning motivation of students, the test method was used to determine the critical thinking ability of environmental pollution material.

By using the experimental class, the application of discovery blended learning in this study was carried out in four meetings. Learning is supported by teaching materials, worksheets, learning videos that have been uploaded on edmodo. Data analysis was carried out, namely normality test, t test (difference test), and descriptive analysis. The normality test was used to determine the distribution of the values obtained were normally distributed or not. Hypothesis testing was carried out to determine the effectiveness of the treatment on the research sample.

3. Results and Discussion

The results of this study include understanding the concept and learning motivation of students. The assessment of concept understanding was measured by a three-tier test sheet, and the assessment of motivation was measured by an observation sheet and a questionnaire sheet. The average value of the results of understanding the concept and learning motivation of students in class VIII C (experimental class) and VIII B (control class) has a significantly different average value. The average value of learning motivation can be seen in Figure 1 and Figure 2.

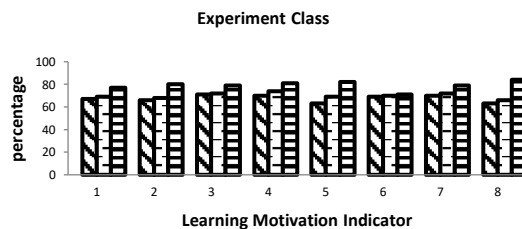


Figure 1. Experimental Class Learning Motivation

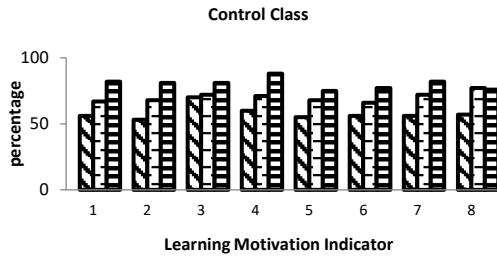


Figure 2. Control Class Learning Motivation

The results of the analysis of students' conceptual understanding with the discovery blended learning model can be seen in Figure 3 and Figure 4.

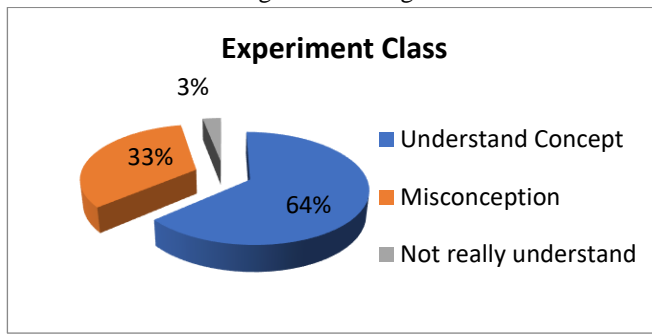


Figure 3. Understanding the Experiment Class Concept

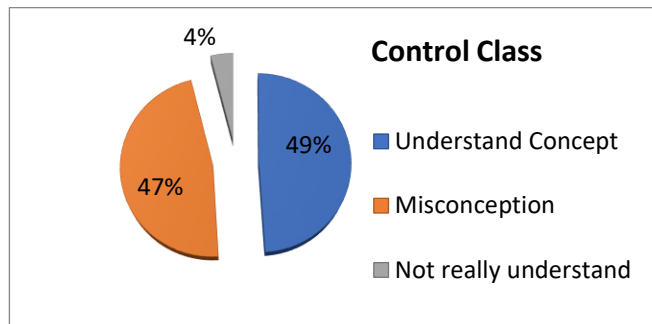


Figure 4. Understanding Control Class Concept

The effectiveness of the discovery blended learning model on concept understanding was analyzed based on posttest value data compiled based on indicators of understanding concepts in Bloom's taxonomy covering C1 to C6 (Anderson, 2006). The assessment of students' conceptual understanding was obtained from the posttest results in both the experimental class and the control class.

The posttest results of the experimental class and the control class showed a significant difference. The posttest score in the experimental class had higher results than the control class. The higher posttest scores in the experimental class were due to the application of discovery blended learning which invited students to be actively involved in the learning process. The effectiveness of learning is the successful use of strategies, models, and methods to grow the independence and skills of junior high school students in the experimental class better than the control class. Learning can be said to be effective in this study having the criteria that the students' mastery of understanding the concepts of the posttest scores of the experimental class is higher than that of the control class. Sari et al. (2013) stated that the application of a suitable learning approach can increase the enthusiasm of students in learning so that it has an impact on learning outcomes. Hosnan (2014) and Sudrajat (2013) add that the scientific approach can make students more active in constructing a concept, law and a principle.

A scientific approach that can make students more active in constructing a concept because it is carried out with steps that include observing, asking, trying, associating, and communicating. Observation activity is the first step of learning which is done by observing a simple experiment conducted by one of the students in front of the class. Observing is an activity for students to identify with the sense of sight (Sufairoh, 2017). The next step of scientific learning is to ask, questioning is an activity of students expressing what they want to know regarding a certain process (Sufairoh, 2017). Steps students ask about what has been observed, and aims to train students in formulating problems and formulating hypotheses (Sadma, 2021). Students will find answers to hypotheses by trying, in this study using the discovery learning method.

The scientific approach with the discovery learning model in the trying step aims to make students' activities more active in the learning process which will have an impact on understanding the material obtained. This is in accordance with the research of Umar et al., (2016) if students are actively involved in learning, it creates a pleasant learning atmosphere and will develop students' understanding of concepts in the classroom.

Based on the results of the analysis in the experimental class and control class after the chi-square test analysis, the data obtained with χ^2_{count} of 9.00 in the experimental class and 6.44 in the control class with χ^2_{table} of 11.07. The results show that the data is normally distributed because $\chi^2_{count} < \chi^2_{table}$. The data is normally distributed, then the analysis using the t test on the posttest results in the experimental class and control class obtained t_{count} of 3.9088 with t_{table} of 1.995. These results show a significant difference between the experimental class and the control class.

The results of the posttest show the success of students in understanding the concept while studying the theme of the human excretory system. The results of the data analysis of the concept understanding test showed that students' conceptual understanding with discovery blended learning modeled better than students with discovery learning models with a comparison of conceptual understanding in the experimental class of 64% and the control class of 46%. This is in accordance with Kurniawan's research (2014) which shows that website-assisted learning can significantly increase students' mastery of concepts compared to conventional learning models. It can be seen that the average value of the experimental class is higher than the average value of the control class.

The posttest used is in the form of three-tier questions consisting of three levels, at the first level consisting of multiple choice questions, at the second level containing a choice of reasons, and the third level containing multiple choice beliefs about answers. The choice of three-tier questions as posttest questions is because by using this question students' conceptual understanding can be observed, as said by Setyaningsih et al.,(2018), three-tier is a three-level multiple choice test, the first level is a multiple choice test, the second level is a multiple-choice question that asks for reasoning or reasons for the answers to the first-level questions, and the third level is a scale that asks the level of students' confidence in the answers given on the first-level and second-level tests.

The findings are supported by research by Kusairi (2013) which suggests that blended learning can improve mastery of concepts and reasoning and train students to be independent and active. The application of discovery blended learning learning model can help students to understand the concept of a material. This is in accordance with Nurhikmah's research et al. (2018) learning with blended learning is more effectively applied in the classroom.

4. Conclusion

Based on the results of research and discussion, it can be concluded that the use of discovery blended learning learning models is effective in understanding the concept of the human excretory system, it is shown when students learn easy to understand. The use of discovery blended learning learning models is effective in learning motivation, this is shown when students are enthusiastic and play an active role in learning.

In the learning process, students are no longer passive in receiving and memorizing the information provided by the teacher, but trying to find out how a certain concept can be found. Theoretically, the study findings are supported by empirical results from previous studies which state that blended learning can increase mastery of concepts and reasoning and train students to be independent and active. The application of discovery blended learning learning models in learning in this case using Edmodo media in learning is something new for students so that it adds to the motivation of students in carrying out learning. This shows that discovery blended learning is effectively used and can be used as an alternative learning model to be applied in learning.

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