IMPROVING UNDERSTANDING OF GENETIC SUBSTANCES THROUGH GUIDED DISCOVERY LEARNING METHODS

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Abstract

This study *aims to improve student learning outcomes on genetic substances by applying the Guided Discovery Learning Method. The subjects of this study were students of class XII MIPA 1 who collected 40 students. This research is a Classroom Action Research (CAR) which consists of two cycles, and each process includes the planning, implementation, and reflection stages. The data collection techniques are test techniques, observations, and field notes. The data analysis technique used is reflective, meaning that it is always reflected in the learning process. The research result is that the Guided Discovery learning method can improve student learning outcomes in understanding genetic material.*

Keywords: *Discovery learning, Genetic substance, Learning outcomes*

1. INTRODUCTION

The students of class XII MIPA1 are the most diverse class, with various characters in this class, from the most diligent to those who are not diligent, from the quiet to the agitated, from the critical thinkers to the numb. But one character that can be proud of this class is the concern for the team when their group work is very cohesive. Even those classified as diligent pay close attention to the material given by the teacher, and those who think critically ask very good questions. The score also varies from the highest score to the lowest score.

In KD 3.1 on growth and development in plants using the practical method, their average score is 80.5. On the subject of KD 3.2 on Metabolism using the lecture, discussion, and question and answer method, their average score was 73.5. Increasing their grades using the same method is challenging because apart from the different materials, the students' character is also diverse. Therefore, it is necessary to use the right way to be more effective to increase the acquisition of their value.

The Kurikulum 2013 offers many methods that can be used to increase value acquisition, including Inquiry-Based Learning, Discovery Learning, Inquiry-Based Discovery Learning, Problem-Based Learning (PBL), Project-Based Learning, and many other methods that can be applied.

Genetic Substance contains basic concepts that students must master, including chromosomes, DNA, RNA, and protein synthesis. To master this material, students must understand correctly to distinguish between chromosomes, DNA, RNA, and students can explain the process of protein synthesis correctly.

According to the author, the most appropriate method is guided discovery learning to study the subject matter in KD 3.3 on Genetic Substance and consider the character possessed by class XII MIPA 1 students. The hallmark of this method is finding concepts through data or information obtained through observation or experimentation under the teacher's guidance. Discovery learning is a cognitive learning method that requires teachers to be more creative in creating situations that make students learn to find knowledge themselves. By using the Guided Discovery Learning method, students of class XII MIPA 1 who have the characters as described above can understand the concept of Genetic Substance well so that their score can be increased further.

The formulation of the problem that will be studied is: Can the application of the Guided Discovery Learning Method improve student learning outcomes on the subject of genetic substance? This research aims to improve student learning outcomes on gene substances

by applying the Guided Discovery Learning Method.

2. RESEARCH METHOD

This research is Classroom Action Research (CAR). The research process was carried out in 2 cycles, and each cycle consisted of four stages: planning, action, observation, and reflection (Arikunto, 2006). This research was conducted at SMA Negeri 2 Tanggul, Jember district. The subjects of the study were students of class XII MIPA 1 with a total of 40 students. Data collection methods used test methods, observations, and field notes.

The data analysis technique used was reflective, meaning that it was always reflected in the learning process. Thus, at the end of each action, a review of the weaknesses and obstacles was carried out and then realized in the improvement of the action plan. After that, it was carried out to implement the next cycle of actions until the optimal cycle limit.

3. RESULT AND DISCUSSION

A. Cycle I

1. Planning

   The activities carried out by the researchers at this stage were preparing a lesson plan (attachment), an assessment system, and making an observation sheet.

2. Action Implementation

   The steps for implementing cycle 1 are as follows:

   a) Opening

   The teacher reminds again about the cell, then explains the learning objectives, methods and motivates students.

   b) Core Activities

   The teacher provides information about the steps of the Discovery Learning method to study the material of Genetic substance; The teacher presents pictures of chromosomes and DNA, observing them. With the guidance and direction of the teacher, students prepare relevant questions. The teacher allows students to look for answers to questions that have been designed, in textbooks, searching on the internet, and biology books. Students are asked to discuss with their classmates, and the teacher unites students by walking around the students. Students present their work in front of the class; the teacher reinforces students' answers. The teacher guides students to conclude about the material that has been studied.

   c) Cover

   The teacher gives awards to students who perform well, the teacher conveys upcoming material and asks students to study preparation for the tests that will be carried out

3. Observe

   Observation activities aim to observe student behavior during learning activities using the Discovery Learning method. The observations made on students are that the percentage of classical completeness for presentation discussions is 83.01%, while the average daily test score is 81.1%, so classical entirety is declared incomplete.

4. Reflection

   After making observations and assessments in cycle 1, the researcher finally concluded that the implementation of learning in cycle one had not been successful, marked by the acquisition of cognitive values , which were still below the classical standard, namely 81.1%. In comparison, the effective value was 83.01%. Students are still not active, and cooperation has not been established; students also do not have responsibilities. Therefore, the second cycle must be implemented.

B. Siklus II

1. Planning

   The activities carried out by the researchers at this stage were preparing a lesson plan (attachment), an assessment system, and making an observation sheet.

2. Action Implementation

   The steps for implementing cycle 1 are as follows:

   a) Opening

   The teacher reminds again about the cell, then explains the learning

objectives, methods and motivates students.

b) Core Activities

The teacher shows a learning video about the protein synthesis process; students observe; teachers who encourage students to list questions; The teacher guides the students to the library to investigate the material; The teacher asks students in groups to formulate questions; The teacher unites students by going around students and providing intensive guidance to help solve students' problems; The teacher asked if there were still those who did not understand; Students in the teacher group guide students' answers; Students make presentations in front of the class; the teacher gives reinforcement of the material. The teacher guides students to conclude about the material that has been studied

c) Cover

The teacher gives awards to students who perform well, the teacher conveys upcoming material and asks students to study preparation for the tests that will be carried out

3. Observe

Observation activities aim to observe student behavior during learning activities using the Discovery Learning method. The observations made to students are that the percentage of classical completeness for presentation discussions is 85.45%, while the average daily test score is 85.5%, so classical entirety is declared complete.

4. Reflection

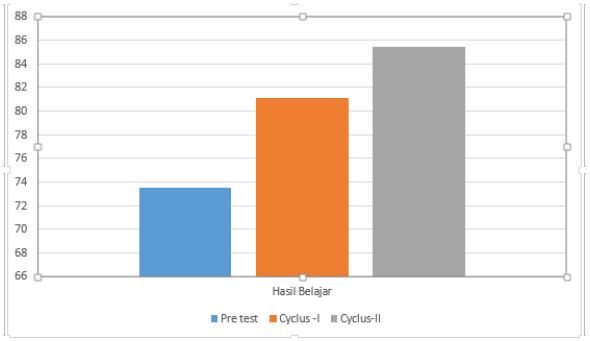
In cycle II, because the classical value has reached completeness, the researcher considers that this research can be concluded that after taking corrective action by guiding cycle II, it turns out that the value of students has achieved completeness.

The results of students' understanding of the Genetic Substance material can be seen in Table I and Figure I below:

Table I. Effects of Understanding Genetic Substance Materials

Explanation	Pretest	Skills I	Siklus II
Learning Outcomes	73,5%	81,1%	85,45%

Figure I. Graph of Increasing Understanding of Genetic Substances



4. CONCLUSION

The application of the Discovery Learning method can improve student learning outcomes on the subject of Genetic Substance; it can be seen from the students' understanding of the genetic substance material test results in the I cycle, getting an average of 81.1%. In comparison, the Genetic substance understanding test results in the second cycle obtained an average of 85.45%.

5. REFERENCE

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