

Analisis Kesulitan Belajar Siswa Kelas XII dalam Mata Pelajaran Genetika di SMA 4 Tanimbar Selatan

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Abstrak

Genetika merupakan salah satu materi biologi yang dianggap sulit oleh siswa karena mengandung konsep abstrak, istilah ilmiah, dan proses yang kompleks. Penelitian ini bertujuan untuk: 1) Mendeskripsikan kesulitan belajar siswa pada materi genetika untuk kelas XII di SMA Negeri 4 Tanimbar Selatan. 2) Mendeskripsikan faktor-faktor penyebab kesulitan belajar siswa pada materi genetika untuk kelas XII di SMA Negeri 4 Tanimbar Selatan. 3) Mendeskripsikan upaya yang dilakukan oleh guru biologi dalam mengatasi kesulitan belajar siswa pada materi genetika untuk kelas XII di SMA Negeri 4 Tanimbar Selatan. Pendekatan yang digunakan dalam penelitian ini adalah kualitatif dengan tipe penelitian studi kasus. Teknik pengumpulan data yang digunakan adalah observasi, wawancara, dan dokumentasi. Analisis data adalah kondensasi data, penyajian data, dan penarikan kesimpulan. Validitas data menggunakan teknik triangulasi dan triangulasi sumber. Hasil penelitian ini menunjukkan bahwa: 1) Kesulitan belajar siswa pada materi genetika untuk kelas XII di SMA Negeri 4 Tanimbar Selatan adalah sebagian besar siswa mengalami kesulitan belajar yang ditandai dengan hasil belajar siswa yang rendah atau di bawah KKM. 2) Faktor-faktor yang menyebabkan kesulitan belajar adalah faktor internal, yaitu kurangnya motivasi belajar siswa, dan faktor eksternal, yaitu metode pengajaran guru dan media pembelajaran yang kurang menarik. 3) Upaya yang dilakukan oleh guru biologi dalam mengatasi kesulitan belajar siswa pada materi genetika untuk kelas XII di SMA Negeri 4 Tanimbar Selatan meliputi memberikan motivasi kepada siswa, mengadakan diskusi dengan teman sebaya, dan melakukan penilaian yang dapat diambil dari berbagai aspek, yaitu pengetahuan, sikap, dan keterampilan.

Kata kunci: kesulitan belajar, genetika, siswa kelas XII, pembelajaran biologi, SMA Negeri 4 Tanimbar

Analysis of Learning Difficulties of Grade XII Students in Genetics at SMA 4 Tanimbar Selatan

Abstract

Genetics is one of the biology materials considered difficult by students because it contains abstract concepts, scientific terms, and complex processes. This study aims to: 1) Describe students' learning difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan. 2) Describe the factors causing students' learning difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan. 3) Describe the efforts made by biology teachers in overcoming students' learning difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan. The approach used in this study is qualitative with a case study research type. Data collection techniques used are observation, interviews and documentation. Data analysis is data condensation, data presentation and drawing conclusions. Data validity uses triangulation techniques and triangulation sources. The results of this study indicate that: 1) Students' learning difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan are that most of the students experience learning difficulties characterized by low student learning outcomes or below the KKM. 2) The factors causing learning difficulties are internal factors, namely students' lack of learning motivation and external factors, namely the teacher's teaching methods and learning media that are less interesting. 3) Efforts made by biology teachers in overcoming students' learning difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan include providing motivation to students, holding discussions with peers, conducting assessments that can be taken from various aspects, namely knowledge, attitudes and skills.

Keywords: learning difficulties, genetics, grade XII students, biology learning, SMA Negeri 4 Tanimbar

1. INTRODUCTION

Education is a step taken by individuals with the intention of realizing and developing their abilities. Through education, the potential within humans can

be identified, so that the educational process can hone intelligence, skills, improve attitudes, shape character, and strengthen a sense of togetherness to build oneself and collectively build the nation. Education serves as a means to refine one's mindset and determine the quality of an individual so that they

can think more progressively and experience development. One of the steps to achieve the nation's goals is through the learning process that takes place in schools.[1] Based on Law No. 20 of 2003, education is defined as a conscious and structured effort to create a learning environment and learning process that enables students to actively develop their potential, including spiritual strength, self-control, character, intelligence, good morals, and the skills necessary for themselves, society, the nation, and the state in a responsible manner. [2], [3].

Biology is one of the most complex subjects because it covers all living things on Earth. Learning biology requires many process skills, such as observing, measuring, using tools, conducting experiments, and communicating the results both verbally and in writing. This type of learning is expected to improve a person's cognitive, affective, and psychomotor abilities. [4].

Learning is fundamental to understanding behavior; learning is also related to fundamental issues concerning emotional development, motivation, social behavior, and personality. The human ability to learn is an important characteristic that distinguishes humans from other creatures. Students' ability to continue learning contributes significantly to the development of diverse lifestyles. However, many students experience various challenges related to learning difficulties. Problems related to student learning difficulties are characterized by low learning outcomes. [1]

Difficulties in learning are obstacles for individuals with average or even higher intelligence levels, causing them to have poor and unsatisfactory learning experiences. These obstacles can arise in students with abilities below or above average, and can hinder students' academic achievement that could otherwise be performed well. [5]. Students often face difficulties in understanding biological concepts due to the nature of science itself and the teaching methods used, where the level of biological organization and the level of abstraction of concepts make learning biology challenging. An overly burdensome curriculum, abstract and interdisciplinary concepts, the complexity of conceptual organization, and difficulty in accessing textbooks are some of the other factors that make the process of learning biology difficult for students. [4]. Various factors contribute to the difficulty of learning, including internal factors (within the student), external factors (from the student's environment), and the learning approach used. All of these elements influence success or failure in achieving goals. [6] ; [7]; [8].

Genetic material, which includes genes, DNA, and chromosomes, is abstract in nature because it cannot be seen directly, making it difficult for

students to visualize. The complexity of this material often leads to misconceptions, making it even more difficult for students to understand and relate genetic concepts to everyday life. The use of inappropriate teaching methods and media by teachers can also exacerbate the failure to convey the material to students. [9]

Based on initial observations at SMA Negeri 4 Tanimbar Selatan, many 12th grade students still have difficulty understanding genetics material. These difficulties are evident in low learning outcomes, errors in solving crossbreeding problems, and students' inability to explain genetic concepts clearly. This could be due to various factors, both internal, such as motivation and initial ability, and external, such as learning methods, media, and learning resources used.

2. RESEARCH METHOD

Types of research

This study uses a qualitative approach to describe students' learning difficulties and the factors causing these difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan. It also describes the efforts made by biology teachers to overcome these learning difficulties. The qualitative approach is used to explore and understand the meaning based on the learning difficulties of students at SMA Negeri 4 Tanimbar Selatan in detail and depth. This research is a case study because it aims to gain a deeper understanding of a program, event, process, and activities related to an individual or group. [10].

Research Location

This research was conducted at State Senior High School 4 Tanimbar Selatan, Tanimbar Islands Regency. State Senior High School 4 Tanimbar Selatan is one of the state high schools that has been accredited B and is one of the favorite schools in the South Tanimbar area. The researcher was interested in examining the learning difficulties of students at State Senior High School 4 Tanimbar Selatan because there has never been an evaluation by the school and no researchers have studied learning difficulties, especially in grade XII biology learning on genetics.

Research Subjects

The researcher used purposive sampling to determine the research subjects. Purposive sampling is a sampling technique in which samples are selected based on specific considerations. Sugiono The sample was determined based on informants who were used as research subjects who could provide information in the form of facts that occurred in the field, as well as being able to provide information about research problems related to student learning difficulties, factors causing student learning difficulties, and efforts to overcome learning difficulties in grade XII students in genetics material. The research subjects

used in this study were grade XII students who were indicated to have learning difficulties and biology teachers.

Data Collection Techniques

The data collection techniques used in this research were observation, interviews and documentation.

Data analysis

Data analysis in this study used Miles et al.'s theory, which states that data collection takes place during and after a certain period of data collection. If the interviewee's answers are deemed unsatisfactory after analysis, the researcher can continue asking questions until credible data is obtained. Activities in qualitative data analysis are carried out interactively and continuously until completion, so that the data is saturated. The data analysis technique used in this study is qualitative data analysis, which consists of four stages, as follows:

1. Data Reduction

Data reduction is the process of selecting, focusing, simplifying, and transforming raw data obtained from the field. At this stage, the researcher selected data relevant to the research focus, namely the learning difficulties of 12th-grade students in genetics at SMA Negeri 4 Tanimbar Selatan. The reduced data included student test results, learning difficulties questionnaires, interviews with teachers and students, and learning documentation. Data not directly related to the research objectives were eliminated, while important data were grouped based on indicators of learning difficulties, such as understanding genetic concepts, use of genetic terms and symbols, ability to solve calculation problems, and internal and external factors that influence students' learning difficulties.

2. Data Display

Data is presented in tables, graphs, and descriptive narratives to facilitate understanding and analysis of the reduced data. Student test results are presented in a table showing the percentage of learning difficulty levels. Questionnaire data is presented in tables and diagrams to indicate the categories of student learning difficulties. Interview results are presented in narrative form, describing the genetics learning environment and the challenges experienced by students and teachers.

3. Conclusion Drawing/Verification

The conclusion-drawing stage is carried out by interpreting the presented data to answer the research problem formulation. The conclusions drawn are tentative and will be continuously verified throughout the data collection and analysis process. Verification is carried out through triangulation of data techniques and sources, namely by comparing test results, questionnaires, interviews, and documentation. Thus, the conclusions drawn reflect the actual conditions of

student learning difficulties in genetics at SMA Negeri 4 Tanimbar Selatan.

3. RESULTS AND DISCUSSION

A. Students' Learning Difficulties in Genetic Material

Researchers obtained data on students' learning difficulties in genetics in grade XII at SMA Negeri 4 Tanimbar Selatan based on observations, documentation, and interviews with four grade XII students and biology teachers.

Students who experienced learning difficulties also tended to exhibit unusual emotional symptoms, such as being moody, irritable, and angry, and when faced with low grades, they did not show any expression of disappointment, sadness, or even regret. Based on the results of observations conducted by the researcher when the teacher was distributing the daily test scores for genetics material to 12th grade students, there were several students who received scores below the minimum passing grade, and there were even students who received scores below the minimum passing grade but did not appear sad or regretful about receiving low scores or scores below the minimum passing grade.

The results of the documentation carried out by the researcher, the daily test scores of class XII students whose scores are below the KKM are shown in the following table:

Table 1. Grade XII Students' Daily Test Scores for Genetics Material

| No | Initials of Grade XII Students | Daily Test Score for Genetics Material |
|----|--------------------------------|--|
| 1 | JL | 55 |
| 2 | AN | 45 |
| 3 | BS | 55 |
| 4 | MK | 50 |
| 5 | LR | 40 |
| 6 | YL | 60 |
| 7 | AM | 70 |
| 8 | ER | 60 |
| 9 | IR | 50 |
| 10 | LS | 50 |
| 11 | MR | 70 |
| 12 | RT | 50 |
| 13 | MS | 55 |
| 14 | DF | 60 |
| 15 | SU | 60 |

Sumber Data Primer. Penelitian 2026

Based on the explanation above, it can be concluded that there are 15 students in grade XII who experience learning difficulties. This can be seen from their low learning outcomes (below the average score achieved by the class group) or their daily genetics test scores which are below the Minimum Completion Criteria (KKM) or less than 75. There are several students who get low scores but it is not

commensurate with the effort they have made, as can be seen in Table 2, as follows:

Table 2. Grade XII Students' Daily Test Scores for Genetics Material Showing Results That Are Not in Balance with the Efforts Made

| No | Initials of Grade XII Students | Daily Test Score for Genetics Material |
|----|--------------------------------|--|
| 1 | FJ | 60 |
| 2 | GLAR | 70 |
| 3 | MHI | 70 |
| 4 | IZNL | 60 |
| 5 | RHN | 60 |
| 6 | ZR | 65 |
| 14 | DF | 60 |
| 15 | SU | 60 |

Sumber Data Primer. Penelitian 2026

Based on the above explanation, it can be concluded that six students experienced learning difficulties because the learning outcomes they received or achieved were not commensurate with the effort they put in. This finding was confirmed by observations, as they were students who attended school diligently, arrived on time, and did not skip class. However, when they received low grades, they appeared sad and disappointed with their results.

Based on the results of observations, interviews and documentation conducted by the researcher, it can be concluded that the learning difficulties of students in genetics material for class XII at SMA Negeri 4 Tanimbar Selatan are as follows:

- a. Students who experience learning difficulties can be identified based on low learning outcomes or below the Minimum Competency Minimum (KKM). This can be seen based on the results of the daily biology test for genetics for grade XII, where 15 students obtained daily test results for genetics below the Minimum Competency Minimum (KKM), namely less than 75.
- b. The learning outcomes achieved do not match or are not commensurate with the efforts made. Six students in grade XII obtained scores below the Minimum Completion Minimum (KKM), even though they are diligent students, always complete assignments late, pay attention to lessons, never arrive late, and never skip class.
- c. Late completion of assignments given by the teacher. Several students were seen completing or submitting answers to their daily genetics test at the end of each class period. They lagged behind their peers in completing or completing assignments beyond the allotted time.

B. Factors Causing Students' Learning Difficulties in Genetics Material.

Researchers collected data using observation, interviews, and documentation to determine the factors causing students' learning difficulties in

genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan. Factors causing students' learning difficulties are things that can cause students to experience learning difficulties. The factors causing learning difficulties consist of internal and external factors. Internal factors include health, learning interest, learning motivation, while external factors include teacher teaching methods, the school's social environment, and parental support.

a. Internal Factors

1. Health

There are two indicators of health factors: fatigue and physical disability. Based on observations conducted by researchers, it was found that students who appeared tired during biology lessons showed signs of fatigue, such as leaning their heads on the table, propping their heads on their arms, and daydreaming. There were even students in the back row who fell asleep during biology lessons on genetics in class.

Based on the results of interviews conducted by researchers, it can be concluded that health factors such as fatigue and impaired five senses can cause learning difficulties, namely, when learning biology genetics material in class, some students are weak and sleepy. This is caused by students' less than optimal or not getting enough sleep on time, often staying up late, and not eating breakfast. And some students who sit in the back seat find it difficult to learn genetics material because they cannot see the material clearly written on the board and some students who have visual impairments or nearsightedness feel quite disturbed.

2. Interest in Learning

Student interest in learning is a feeling of joy or happiness within a person, or a feeling experienced without coercion from others. Low interest in learning can affect a student's enthusiasm for learning. Student interest in learning can be determined by their enjoyment of the classroom learning process, their interest in learning, their attention span, and their engagement in learning.

Based on the results of observations conducted by researchers regarding the learning interests of grade XII students at SMA Negeri 4 Tanimbar Selatan, it was found that students appeared or appeared not very enthusiastic in learning biology genetics material in class. However, for student attention during learning was quite good, although there were some students who sometimes joked or were busy chatting with themselves, paid less attention to learning, daydreamed and some even fell asleep during learning. And student involvement in learning biology genetics material also seemed lacking, because the teacher was more dominant in explaining and students appeared passive or less actively contributing to learning

3. Motivation to Learn

Learning motivation is a drive within students to achieve something. When learning motivation is low,

it can certainly trigger problems or difficulties in learning. Based on student learning motivation when participating in biology lessons on genetics, this can be seen through several indicators: students are serious about completing assignments given by the teacher, achieving good daily test scores or submitting answers on time. Students ask questions when experiencing difficulties, students are enthusiastic about completing daily genetics test questions given by the teacher. Students learn independently and do not depend on others, and students are able to defend their own answers.

Based on observations conducted by researchers on the learning motivation of 12th-grade students at SMA Negeri 4 Tanimbar Selatan, students tended to be passive or unenthusiastic during lessons, although learning seemed to flow normally. Most students remained silent or were reluctant to ask questions when the teacher gave them the opportunity to inquire about their understanding of the genetics material being taught.

b. External Factors

1. How to Teach Teachers

Based on observations conducted by researchers during the biology learning process on genetics material in grade XII, it shows that the teacher teaches using the lecture method. The learning media used by the teacher are a whiteboard and markers. The learning media used is not varied enough, so some students appear sleepy and bored when the teacher explains. This can be seen in the fact that some students do not pay attention to the teacher's explanation. The teacher delivers the material well and clearly when learning biology on genetics material. The teacher also invites students to discuss during the lesson in class.

2. School Social Environment

The school's social environment is one factor influencing students' learning difficulties. These factors include the relationship between teachers and students, relationships between students, classroom conditions, and the school environment.

Based on observations conducted by researchers in the environment of SMA Negeri 4 Tanimbar Selatan, the relationship between teachers and students during biology learning on genetics material is good and communicative. Relationships between students in grade XII appear to be good and students often exchange opinions during biology learning on genetics material. Class conditions during the biology learning process on genetics material appear conducive and students listen to the teacher's explanations. However, sometimes the class conditions also become noisy because some students joke and chat during the lesson.

3. Parental Support

Parental support is one factor influencing learning difficulties. Parents who pay little attention to their children's education are often indifferent or unconcerned about their children's learning and fail to

provide learning materials to support their success. Parental support can be measured by moral support, material support, and recognition.

Based on observations conducted by researchers in grade 12, it was apparent that parental support for biology and genetics learning was very good. Students' needs for learning activities were met. All grade 12 students had textbooks, worksheets, notebooks, and stationery to support their learning.

c. Efforts to Overcome Students' Learning Difficulties in Genetics Material.

Providing learning motivation to students is one way teachers can help foster student interest and motivation in biology. This motivation is provided by teachers during biology lessons on genetics in class. Based on interviews with biology teachers regarding learning motivation.

Discussion of Findings

a. Students' Learning Difficulties in Genetics Material

Learning difficulties are a condition that can prevent students from learning as they should. Students who experience learning difficulties usually experience failure in achieving mastery of certain materials or objectives within a predetermined timeframe. The learning difficulties experienced by 12th-grade students at SMA Negeri 4 Tanimbar Selatan in biology learning on genetics were identified as having 15 learning difficulties.

This can be seen based on: 1) the results of the daily tests obtained are low or below the KKM. 2) the results obtained are not commensurate with the efforts made. 3) students tend to be slow in completing the tasks given, namely when working on the daily test of genetics material, there are several students who are late in submitting answer sheets. 4) showing abnormal student behavior, namely when the biology lesson for genetics material begins, there are several students who arrive late. 5) students behave inappropriately, namely when the teacher explains the material, there are several students who act indifferently, chat with their friends, daydream and play with cellphones.

b. Factors Causing Students' Learning Difficulties in Genetics Material.

The factors causing learning difficulties in genetics for grade XII students at SMA Negeri 4 Tanimbar Selatan are caused by internal and external factors. Internal factors include health, student interest in learning, student motivation, and student attitudes during learning. Meanwhile, external factors include teacher teaching methods, the school's social environment, the classroom environment, and parental support.

Based on the findings, it can be concluded that health factors can contribute to students' learning difficulties. This aligns with research by Setiawan, who argued that health significantly impacts a person's learning process. A healthy person is more

likely to be able and capable of participating effectively in the learning process, unlike someone who is unhealthy. [11].

The results of this research are in line with previous research conducted by Saparuddin, which stated that health factors can cause students' learning difficulties in biology because students cannot properly process stimuli or explanations from teachers. [12].

The learning interest factor in students' learning difficulties in learning biology genetics material for grade XII is that during learning there are some students who are less interested in genetics material and there are even some students who prefer other subjects. This is because genetics material is considered difficult, too much reading or theory, difficulty in memorizing quite a lot of material and the use of other names or terms in genetics material and student involvement in learning is felt to be lacking. Students pay attention to learning well, namely by preparing textbooks before learning begins.

c. Efforts to Overcome Students' Learning Difficulties in Genetics Material

Biology teachers provide learning motivation during genetics lessons in class. They also provide advice and motivation to students to study or listen carefully to the material presented. This motivation can help encourage students to be serious about learning and understand the material explained by the teacher.

4. CONCLUSION

Students' learning difficulties in genetics material for grade XII at SMA Negeri 4 Tanimbar Selatan are that most students experience learning difficulties characterized by low learning outcomes or below the Minimum Completion Criteria (KKM). The results achieved by students are not commensurate with the efforts that have been made, slow in completing tasks given by the teacher. Students show abnormal behavior such as arriving late to class. Students also show unnatural attitudes such as indifference, and pretending. And show unnatural emotional symptoms, namely when getting a low score or below the Minimum Completion Criteria (KKM) do not show sadness or regret. Based on students' attitudes or behavior, it can be concluded that the types of difficulties experienced are slow learners and learning disorders.

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