

Improving Student Motivation and Learning Outcomes Through the Student Team Achievement Divisions Model

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Abstract. Biology is a science that deals with natural phenomena and objects that are systematically arranged regularly, and generally accepted in the form of a collection of observations and experiments. Biology has a very important role in providing an understanding of the characteristics and phenomena of nature, as well as of living things and life processes. Therefore, the purpose of this study is to increase student motivation and learning outcomes through the Student Team Achievement Divisions (STAD) model in Biology class XI IPA 3 SMAN 7 Sigi. 33 students of class XI IPA 3 consisting of 9 males and 24 females using data collection techniques, namely qualitative data and quantitative data. Data collection techniques for each type of data are 1) Qualitative data is collected by using observation sheets, namely making a series of direct observations of researchers during the learning process; and 2) Quantitative data is collected by giving tests at the end of each cycle. The data analysis technique used is data reduction, data presentation, and conclusion. The data obtained were analyzed using the percentage of individual absorption and classical completeness techniques obtained by students. The results of this study indicate that 1) The application of the Student Team Achievement Divisions (STAD) model can increase student learning motivation in Biology class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year; 2) The application of the Student Team Achievement Divisions (STAD) model can improve student learning outcomes in Biology class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year; 3) The application of the Student Team Achievement Divisions (STAD) model can increase student motivation and learning outcomes in Biology class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year.

Keywords: Motivasi, Hasil Belajar, Model Student Team Achievement Divisions (STAD)

1. Introduction

Biology is a science that deals with natural phenomena and objects that are systematically arranged regularly, and generally accepted in the form of a collection of observations and experiments. (Didja, 2016; Purwono, 2014). Biology has a very important role in providing an understanding of the properties and natural phenomena, as well as about living things and life processes (Kristyowati & Purwanto, 2019).

In fact the teacher realizes that learning Biology is still a number of knowledge that must be memorized, not through direct learning activities and the process of discovery (Ichsan, Dewi, Hermawati, & Iriani, 2018). The teaching and learning activities developed by the teacher are very monotonous and still use conventional methods, which are limited to applying the lecture method, listening to the teacher's explanation in an orderly (verbalistic) manner, then working on practice questions (Khaatimah & Wibawa, 2017). In learning, teachers rarely use interesting learning media and help students understand the material. The learning process does not provide opportunities for students to actively interact with the teacher and subject matter so students tend to be passive while the teacher is active (teacher-centered) (Putri, Kuswandi, & Susilaningsih, 2020).

The learning method used by the teacher mentioned above caused several problems, including Biology subjects becoming less attractive to students, students becoming bored during Biology lessons, verbalism occurring in students, the knowledge students obtained did not last long, and student's understanding of the material low. The various problems above lead to low student learning outcomes in Biology lessons in class XI IPA 3 SMA Negeri 7 Sigi.

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As a supervising teacher, it is necessary to take action, namely conducting classroom action research to overcome the problems mentioned above. In this classroom action research, we tried to apply the Student Teams-Achievement Development Division (STAD) model. By applying this model, of course, it is hoped that it can improve the quality of learning which of course also increases student motivation and learning outcomes. Student Team Achievement Divisions (STAD) are one of the simplest types of cooperative learning. Students are placed in learning teams of four to five people who are mixed according to their level of performance, gender, and ethnicity (Armstrong & Palmer, 1998; Tiantong & Teemuangsai, 2013; Yeung, 2015).

2. Method

This research uses classroom action research (CAR). PTK is a translation of Classroom Action Research, which is Action Research conducted in the classroom (Khasinah, 2013; Mettetal, 2002; Wijaya, 2017). PTK is research conducted by teachers in their own classes through self-reflection with the aim of improving their performance so that student learning outcomes increase (Zaenal, 2009). The procedure for this research activity was carried out through 2 cycles, each cycle consisting of four stages, namely 1) Planning, 2) Implementation, 3) Observation, 4) Reflection, (Arikunto, 2021).

As for the subject of this study, there were 33 students in class XI IPA 3 consisting of 9 males and 24 females using data collection techniques, namely qualitative data and quantitative data. Data collection techniques for each type of data are 1) Qualitative data is collected by using observation sheets, namely making a series of direct observations of researchers during the learning process; and 2) Quantitative data is collected by giving tests at the end of each cycle. The data analysis technique used is data reduction, data presentation, and conclusion. The data obtained were analyzed using the percentage of individual absorption and classical completeness techniques obtained by students, (Sugiyono, 2018).

In addition, the success criteria for the action if the action will be stopped when the success criteria have been met. The criteria for the success of the action are determined based on the success indicators of this class action research if the learning outcomes of the basic competence Biology subject "Analyze the relationship between the structure of the organ-composing tissue in the respiratory system in relation to bioprocesses and functional disturbances that can occur in the human respiratory system" in class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year achieves a minimum individual absorption of 70% and a classical absorption of 85%. The success referred to in this PTK is the success of the assessment in the cognitive domain. Students are declared complete with their learning motivation when there are at least 3 aspects/scores (score 60) contained in students when learning activities take place. The observation sheet is used to determine the implementation of teaching and learning activities carried out by teachers/researchers using the Student Team Achievement Divisions (STAD) model. The indicator of the success of this observation is if the average teacher's teaching and learning activities are "Good" and the average student's motivation is "Completed".

3. Results and Discussion

As stated in the previous section, each cycle in this study consists of several stages, namely: Initial Reflection, Planning, Implementation, Observation, and Reflection. The results obtained at each stage in each cycle are explained as follows:

3.1 Cycle I

Early Reflections

The activity carried out at this stage is to determine learning materials that are considered urgent for the problem to be handled by the teacher. The teaching material in question is Biology material, especially the basic competence "Analyzing the relationship between the tissue structure of organs in the respiratory system in relation to bioprocesses and functional disturbances that can occur in the human respiratory system."

At this stage, the researcher also formed cooperative groups, each group consisting of 5 people according to the lesson plan. The cooperative groups formed are heterogeneous. That is, each group formed is distributed heterogeneously on the intellectual level of students based on the results of the teacher's research.

Planning

A number of activities that have been carried out at this stage include preparing: a) Lesson plan by presenting basic competencies: Analyzing the relationship between the tissue structure of organs in the respiratory system in relation to bioprocesses and functional disturbances that can occur in the human respiratory system, with indicators, namely 1) Finding the location and structure of the respiratory organs of humans and animals; 2) explanation of the structure and function of the respiratory organs in humans and animals; 3) Explanation of the process of exchanging O_2 , CO_2 from the alveoli to the capillaries, the content of substances in cigarettes that can interfere with the respiratory system; b) Learning scenarios and LKS; c) complete the book package; d) Observation sheet for observation while the teacher/researcher is carrying out learning activities; f) The format of the assessment of learning outcomes is in accordance with predetermined indicators.

Implementation

The implementation of the actions in cycle 1 was carried out 1 face-to-face in learning activities outside of the end-of-cycle test activities. The number of lesson hours is 4 hours of lessons (4 x 45 minutes), while the final cycle test takes 45 minutes. The face-to-face meeting will be held on Wednesday, January 11, 2023, from 1st to 4th hour and the main material taught is the structure and function of the respiratory organs in humans and animals (insects and birds), namely a) Finding the location and structure of the respiratory organs humans and animals; b) Describe the structure and function of the respiratory organs in humans and animals; c) Explain the process of exchanging O_2 , CO_2 from the alveoli to the capillaries, the content of substances in cigarettes that can interfere with the respiratory system.

In this first cycle, the teacher/researcher presents learning material according to the plan, namely applying the STAD model. The teacher's learning steps are a) Convey all the goals to be achieved during learning and motivate students to learn; b) Presenting information to students by way of reading; c) Organize students into study groups and helping each group to make the transition efficiently; d) Guiding the group in work and study; f) Requesting a group presentation of work results; g) Appreciate the learning outcomes of both individual and group efforts.

In the next meeting, a week after the implementation of the lesson, the final test for cycle I was held on Wednesday, January 18, 2023, in the form of 10 multiple-choice questions with a duration of 45 minutes for completion. The results can be seen in table 1 below:

Table 1.
Recapitulation of Final Test Assessment Results of the cycle I

No.	Acquisition Aspect	Results
1	The number of students	33 People
2	Number of students who completed	26 People

3	Classical mastery	79% People
4	The highest score	100 (4 people)
5	Lowest value	50 (1 person)

Source: Research Results

Of the 33 students, there were 26 people (79%) who completed, the highest score of 100 was achieved by 4 students while 1 student got the lowest score of 50.

Observation

Observation activities were carried out by observers during the implementation of learning, namely on January 18, 2023. The focus of observation was observing teacher activities and observing student motivation during learning implementation.

a. Teacher Activity

Observation of teacher activities aims to see the suitability of the implementation of learning with the learning plan. In this first cycle, the teacher/researcher presented learning material according to the plan, namely the application of the Student Team Achievement Divisions (STAD) model. All aspects of the assessment are generally of good value, only there are those that are of good enough value, namely in terms of time management and student enthusiasm.

b. Student Motivation

Observation of student motivation is carried out by observers during the implementation of learning. Observation results can be seen in table 2 below:

Table 2.

Recapitulation of Observation Results of Student Learning Motivation in Cycle I

Criteria	The number of students	Percentage
Complete	27	81,82
Not Completed	6	18,18
Amount	33	100

Source: Research Results

In cycle I, out of 33 students, 27 students (81.82%) completed their learning motivation. Meanwhile, there were 6 students (18.18%) who had not completed their learning motivation. In this first cycle, the teacher/researcher presented learning material according to the plan, namely the application of the Student Team Achievement Divisions (STAD) model. Based on the results of the observations, at first, the students were somewhat confused. This is because new students experience the Student Team Achievement Divisions (STAD) learning model. However, after being explained again, students were so enthusiastic and excited, worked together, and began to show the expected learning outcomes.

Reflection

The results of learning observations show that what still needs to be optimized is the enthusiasm of students in participating in learning, as well as time management for researchers. Based on the results of Cycle I, the results of observations on student motivation had not been achieved because only 24 people were active (72.73%). Likewise, the results of the final cycle I test of classical completeness were only 79%. For that, the researcher continued to Cycle II.

3.2 Cycle II

The basic competencies presented in cycle II are still the same as the basic competencies in cycle I, namely: Analyzing the relationship between the tissue structure of organs in the respiratory system in relation to bioprocesses and functional disturbances that can occur in the human respiratory system. As in cycle I, in cycle II

several activities were carried out at each stage. The grouping of students still refers to the division of groups in cycle I.

Planning

A number of activities that have been carried out at this stage include preparing a) Lesson plans by presenting basic competencies: "Analyzing the relationship between the structure of the organ-composing tissue in the respiratory system in relation to bioprocesses and functional disturbances that can occur in the human respiratory system", with indicators: a) Analyze the respiratory mechanism in humans and animals (insects and birds), namely 1) Analyze disorders and diseases related to the respiratory system; 2) Explain the effect of smoking on respiratory health; 3) Explain the relationship between unclean environmental air conditions; 4) Explain the relationship between smoking behavior and the structure of the respiratory organs; b) Learning scenarios and LKS; c) Prepare a package book; d) Observation sheet for observation while the teacher/researcher is carrying out learning activities; f) The format of the assessment of learning outcomes is in accordance with predetermined indicators.

Implementation

The implementation of the actions in cycle II has carried out 1 face-to-face learning activity outside of the end-of-cycle test activities. The number of lesson hours is 4 hours of lessons (4 x 45 minutes), while the final cycle test takes 45 minutes. The first face-to-face meeting in cycle II will be held on Wednesday, January 25, 2023, from 1st to 4th hour. The main materials taught are: a) Respiratory mechanisms in humans and animals (insects and birds); b) Disorders and diseases related to the respiratory system.

At this stage, according to the plan, we still apply the STAD model. The learning steps, namely the teacher a) Convey all the goals to be achieved during learning and motivate students to learn; b) Present information to students by way of reading; c) Organizing students into study groups and helping each group to make the transition efficiently; d) Guiding the group in work and study; f) Requesting a group presentation of work results; g) Appreciate the learning outcomes of both individual and group efforts.

In the following week, namely Wednesday 1 February 2023, an assessment of the final cycle II test was carried out in the form of 10 multiple-choice questions with a completion time of 45 minutes. The results can be seen in Table 3 below.

Table 3.

Recapitulation of Final Test Assessment Results of Cycle II

No.	Acquisition Aspect	Result
1	The number of students	33 People
2	Number of students who completed	30 People
3	Classical mastery	91% People
4	The highest score	100 (7 people)
5	Lowest value	60 (3 people)

Source: Research Results

Of the 33 students, 30 (91%) completed, 7 students achieved the highest score of 100 while 3 students received the lowest score of 60. More detailed results can be seen in the appendix.

Observation

Observations by observers were carried out during the implementation of cycle II learning, namely on Wednesday, January 25, 2023. The focus of observations by observers was the observation of teacher activities and observations of student activities during the implementation of learning.

a. Teacher Activity

Observation of teacher activities aims to see the suitability of the implementation of learning with the learning plan. All aspects of the assessment are Good. More complete observation results can be seen in the appendix.

b. Student Motivation

The results of observing student motivation can be seen in table 4 below:

Table 4.

Recapitulation of Observation Results of Student Learning Motivation Cycle II

Criteria	The number of students	Percentage
Complete	33	100
Not Completed	0	0
Amount	33	100

Source: Research Results

In cycle II, there were 33 students who were declared complete in their learning motivation. This means all aspects of motivation have been owned by all students. More detailed results can be seen in the attachment. In this second cycle, the teacher/researcher presents learning material according to the plan, namely using the Student Team Achievement Divisions (STAD) model. And based on the observations of researchers that students are so motivated and very enthusiastic about doing the tasks given.

Reflection

Based on the results of Cycle II where the classical completeness was 91%. This figure shows that the individual absorption capacity indicator of at least 70% and the classical absorption capacity of 85% has been achieved. For this reason, this research only reached cycle II. As for motivation, all of them were stated to be complete because the 33 students all achieved a minimum score of 60.

Discussion

Completeness of Student Learning Outcomes

After observing and comparing the results obtained by students in cycle I with the scores/results achieved by students in cycle II, it turned out that there were differences in the results achieved by students. The difference in value in question is that the results/values from cycle I to cycle II experienced an increase in classical mastery, namely from 33 students in classical completeness in cycle I there were 26 people (79%) in cycle II it increased to 30 people (91%). The highest score of 100 was 4 people in cycle I but in cycle II it increased to 7 people who got a score of 100. The lowest score also experienced a positive change where in cycle I the lowest score was 50 by 1 person and in cycle II the lowest score was 60 by 3 people. A comparison of the two cycles can be seen in Table 4.5 below:

Table 5

Comparison of Final Test Results for Cycle I and Cycle II

No.	Acquisition Aspect	Results	
		Cycle I	Cycle II
1	The number of students	33 People	33 People
2	Number of students who completed	26 People	30 People
3	Classical mastery	79%	91%
4	The highest score	100 (4 people)	100 (7 people)
5	Lowest value	50 (1 people)	60 (3 people)

Source: Research Results

Teacher Ability in Managing Learning

Based on the results of observations, the teacher/researcher is able to manage learning well because he does all aspects of learning well. In the first cycle, the management of learning generally went well, but time management and student enthusiasm still needed to be improved. However, in cycle II the learning management experienced an increase with an average of "Good" and this had a positive impact on student learning completeness in this case student motivation and learning outcomes increased and everything was completed because it obtained a minimum score of 60 completeness.

Student's motivation to study

Students learning motivation also experienced an increase where in the first cycle of 33 students it was stated that their motivation was complete or got a minimum completeness score of 60 by 27 people (81.82%) and in cycle II all 33 students were declared 100% complete. The comparison can be seen in the following table:

Table 6.

Comparison of Observation Results of Student Learning Motivation Cycle I and Cycle II

Criteria	Cycle I		Cycle II	
	The number of students	Percentage	The number of students	Percentage
Complete	27 Orang	81,82	33	100
Not Completed	6 Orang	18,18	0	0
Amount	33	100	33	100

Source: Research Results

This research only reached the second cycle because the indicators of learning success/mastery, namely individual absorption of at least 70% and classical absorption of 85%, were achieved, namely 91%. The intended learning outcomes are results/values in the cognitive/knowledge domain. Likewise with the results of observations of teachers who teach in this case the researcher in the process of teaching and learning activities on average is good, and student motivation is also 100% complete.

4. Conclusion

Based on the results of the class action research above, the researcher can draw conclusions, namely: 1) The application of the Student Team Achievement Divisions (STAD) model can increase student learning motivation in Biology class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year; 2) The application of the Student Team Achievement Divisions (STAD) model can improve student learning outcomes in Biology class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year; 3) The application of the Student Team Achievement Divisions (STAD) model can increase student motivation and learning outcomes in Biology class XI IPA 3 SMAN 7 Sigi even semester of the 2022/2023 academic year.

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