THE APPLICATION OF LEARNING MODELS NUMBER HEAD TOGETHER TO IMPROVE BIOLOGY LEARNING OUTCOMES IN SUBJECT OF PHOTOSYNTHESIS

Vandalita Maria Magdalena Rambitan
Departement of Biology Education University of Mulawarman
E-mail: vandalitammr@ymail.com

Abstract

Learning models of Number Head Together (NHT) is a learning model that is designed to influence the pattern of student interaction, where the teacher gives a question by mentioning the number of students and the cooperation between students in small groups with the purpose to improve students academic mastery. The research aims to improve learning outcomes of biological subjects Photosynthesis through the application of learning models of Number Head Together (NHT) students grade VIII H at Junior High School 7 Samarinda in learning 2012/2013. This research is a class action that was implemented in three cycles each cycle consisting of four stages, namely planning, implementation, observation, and reflection. Data obtained through observation and test results to learn in each cycle. First cycle on the average biology student learning outcomes increased by 23,82% from baseline by 43,95 points to 54,42 with an average increase of 23,20 points. In the second cycle, the average value of the study of biology students increased by 3,84% of the value of the learning first cycle by 54,42 points to 56,51 with an average increase of 18,83 points. In third cycle, the results of biological studies of students increased by 19,25% of the value of the learning second cycle by 56,51 points to 67,39 with an average increase of 23,26 points. Based on these data it can be concluded that the learning models of Number Head Together (NHT) is able to improve the biological learning outcomes on the subject of Photosynthesis to the VIII H graders in state Junior High School 7 Samarinda in learning 2012/2013.

Keywords: Learning Models, NHT, Biological Learning Outcomes.

BACKGROUND

Nowadays, the world of education is fared to a new challenge which is the knowledge era, it is marked with the development of technology that grows very fast and full of unsureness and dilemma. According to Handy in Gibson (2000), that era is intellectual capital era. Therefore, the aims of education and teaching should be firstly filled with the totality of student intellectual skill, so it can be assimilated with the knowledge era in the future. Updating of education should be always done to improve the quality of national education. However, the effort to improve the quality of education is not easy because of the very complicated matters. Ideally, education is not only oriented in the past and present but it is also a process that anticipates and torterns for the future. According to Trianto (2007), education is not only preparing students for a profession or position, but to accomplish problems found in daily life.

The learning process usually makes students as teacher's narration listeners. The student are seldom to have any questions although the teacher often asks for sort a questions for those who does not understand yet. The student are also less of initiative in doing the tasks unless there are any orders from the teacher. Eventually, the learning process tends to be boring, the material gets difficult to understand, and makes students lazy to study. This passive behavior is not only happened in a certain subject, but also to almost all of the subjects at school, including biology, so that the learning result of students in biology is still classified low.

Slameto (2003) states that the factors which affect the students learning outcomes are the factor from student itself or individually and the factor from environtment. The individual factor is about the abilities of the students such as motivation, interest, behavior, habbit, studying style, social economy, physical and psicologycal conditions. The environtmental factor is about the teaching quality whether the learning process is effective in reaching the instructional aim or not. The learning result is an impact of learning process which can be seen in two defferent points of view, those are as teaching impact and companion impact. The companion impact is measured by the score in student report card or graduate certificate and the companion impact is measured by the student ability in other field.

The efforts to improve biological learning outcomes often faced various challenges for the teacher. Some challenges are the lack of teacher's creativity in learning process to make the teaching process more enjoyable, the lack of teacher's knowledge in defining the suitable learning model for a subject of material, and the minimum time within available in curriculum for teaching process in one meeting.

Based on the researchers observation in state Junior High School 7 Samarinda especially in VIII H class that has 43 students, the learning process is done with the conventional teaching without any development so that the learning tends to be monotonous and less of interesting. The false choice of learning model on a subject or material is also being a cause of the unbalanced capability of students in understanding every subject.

These causes above show that it is necessary to have a renewing of learning model which is a learning that can motivate the students to be more active in studying. The students activeness is so hoped in biological learning process where it will impact positively to students memory concerning the thought material. A biological concept shall be more easily understood and reminded by student if it is served by proper, clear, and interesting steps and procedures. The activeness of student is one of the factors which affect the success in learning.

The cooperative learning model is a model that demands the student activeness in small group. One of working types of cooperative learning group is Number Head Together (NHT). NHT has a learning structure which is designed to affect the student interaction pattern, in which the teacher giving question by mentioning the students number and then there will be an internal teamwork in a small group with the purpose of improving the student academic capability.

Based on those reasons, the researcher is interested to analyze the application of learning model of NHT to improve the biological learning outcomes in grade VIII in state Junior High School 7 Samarinda learning year of 2012/2013, by limiting the problems of the research become only discussing about the improvement of biological learning outcomes on subject of Photosynthesis to VIII H graders in state Junior High School 7 Samarinda.

The questin of problem the research is how to improve the biological learning outcomes on subject of Photosynthesis through the application of learning model of Number Head Together to VIII H graders in state Junior High School 7 Samarinda learning year of 2012/2013.

The aim of the research is to improve the biological learning outcomes on subject Photosynthesis through the application of learning process of Number Head Together to VIII H graders in state Junior High School 7 Samarinda learning year of 2012/2013.

RESEARCH METHOD
Type of Research

      This research is a class action (action research) is a systematic study of classroom practices with the purpose to improve the quality of the learning process and student learning outcomes by performing certain actions (Sukidin, 2002). Classroom action research has four stages, namely planning (perencanaan), action (tindakan), observation (pengamatan), and reflection (refleksi). Each cycle is implemented in accordance with the learning objectives to be achieved.

Design of Research

      Shape the design of the work done is a model process in the form of rounds (cycles) after first formulated the main problems of biology and the improvement of learning alternative solutions. The study took place in three cycles. Each cycle is implemented in accordance with changes to be achived.

      The grooves in this study can be described as follows:
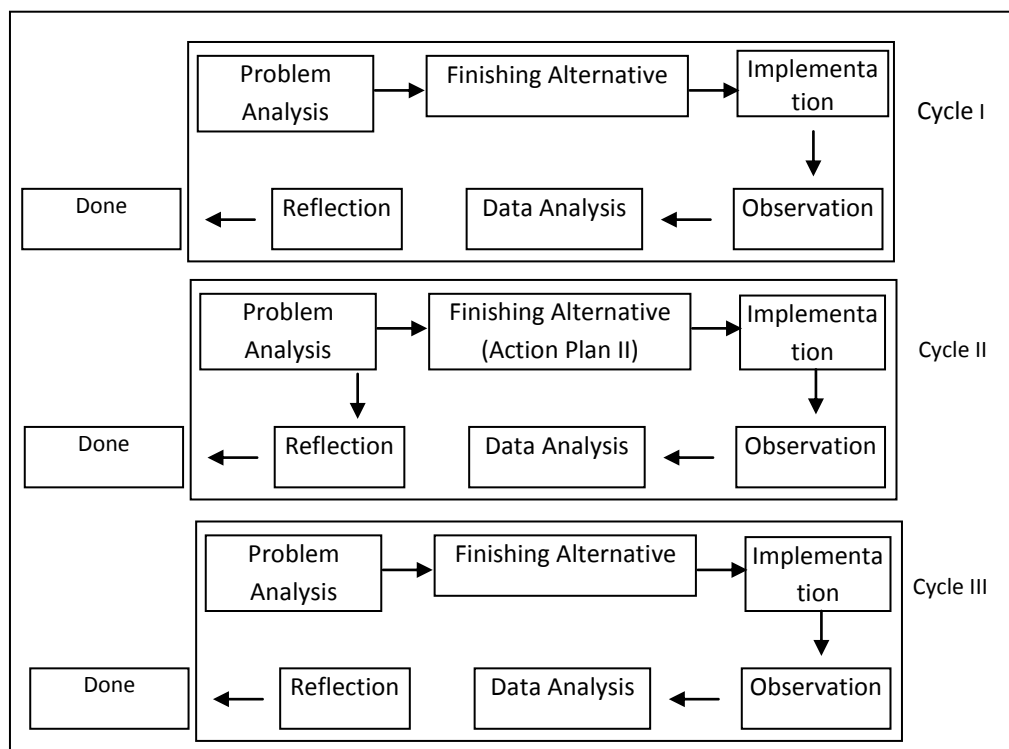
(Source: Tim Pelatihan PGSM. 1999)
Figure 1. The Flow In The Classroom Action Research

Time and Place Research

      The research is done on March 30,2013 until May 12, 2013 at Junior High School 7 Samarinda is located at Samarinda Ulu.

Research Subjects and Objects

      Subjects in this study were students in grade VIII H (totaling 43 students) selected from a class VIII at Junior High School Samarinda Ulu. While that is the object of this study is the process of learning by using learning models Number Head Togheter (NHT).

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Data Collection Techniques

The data was collected through: (1) The assignment of each meeting, Homework, (2) A written test, to determine the increase in learning outcomes per cycle, (3) Observations, to determine the level of teacher activity and student activity levels during learning takes place or at the time of execution of actions, carried out by direct observation of teacher and student activities.

RESULT AND DISCUSSION

RESULT

The results in each cycle can be described as follows:

First Cycle

a) **Problems**

Problems that occur before the applied learning models Number Head Together (NHT) on the subject of Photosynthesis is the fundamental value that has not reached the completeness of learning and the learning process is implemented conventionally.

b) **Plan**

At this stage the researcher create lesson plans and learning scenarios relating to the subject of Photosynthesis. For the first meeting, the material presented on Photosynthesis apperception. While the third meeting was held the test to see student learning outcomes. To find out the results of studying the first and second meeting researchers to make an evaluation tool of the end test questions of first cycle. Addition to preparing lesson plans, learning scenarios, LKS (worksheet), homework after learning, and the test of first cycle, researchers are also preparing for the observation sheet.

c) I**mplementation Actions**

Researchers act as teachers implement teaching and learning activities in accordance with the scenario and lesson plans that had been developed researchers have also run the technical suggestions of teaching in the classroom suggested by biology teacher grade VIII H to make improvements in teaching and learning.

d) **Observation**

Observation of student activities and teacher. The observations obtained through observation sheets completed by the observer. Observations obtained from the observation of student activities for the whole group and observation activities of teachers.

e) **Reflection**

The things have achived in the first cycle: (1) Students are getting interested to learn in groups, (2) Students are afraid to ask if there is not yet understood.

Some of the things that become obstacles during the learning process: (1) The class is noisy when doing worksheet and when to apply the work steps in learning model Number Head Together (NHT) because students have not been able to adapt to the learning models is applied, (2) There are a number of students who dominate the group work so that other students looked passive, (3) The average value of student learning outcomes is still relatively less, (4) At this stage answering the student are call is willing to move, but there are some students are still asking the group when answering a question put by the teacher to work on the board.

Based on the results of learned on first cycle for 54,42 the less criteria, then the implementation of the learning first cycle continued into the second cycle because of the values obstained have not yet reached the completeness study of 65,00.

Second Cycle

a) Problems

Problems that occurred in the previous cycle is the first cycle have not reached the completeness of learning and the learning process using a learning model Number Head Together (NHT) is not good.

b) Plan

In the second cycle researchers prepared the scenario of learning, lesson plans relating to the subject of Photosynthesis, worksheet and homework for the second meeting. The material presented in the first meeting of the leaves are the parts that play a role in the process of photosynthesis, followed by the second meeting of the factors that affect the process of photosynthesis, followed by administering the test at the third meeting.

c) Implementation Actions

In the second cycle, the teacher carry out learning scenarios and learning plans. In addition to learning based on the scenario that has been created, teachers also carry out some remedial action has been planned.

d) Observation

Observation of student activities and teacher. The observations obtained through observation sheets completed by the observer. Observations obtained from the observations of student activities for the whole group and observation activities of teachers.

e) Reflection

Things that have been achieved in the second cycle, namely: (1) Students will begin to give an opinion, motivated in answering questions on worksheets, want to respond to the opinions of others, and may cooperate with others students, (2) Guidance of teachers to students has to be implemented equally, (3) The class began to be controlled by the teacher, (4) The average value of the study of biology students has increased from 54,42 on the first cycle to 56,51 on the second cycle.

The things that need improvement in the learning activities in the next cycle are: (1) understanding students need to be further enhanced with the delivery of content that is not too fast, (2) The motivation to the students needs to be improved, especially in group work, (3) At the stage of answering the call number of students willing to come forward and have started doing their own tasks assigned by the teacher to work on the board, although there are two people who still ask a friend to another.

Based on the result of study on the second cycle of 56,51 with less criteria, then the implementation of the learning second cycle to third cycle was continued because the value obtained has not reached the value of learning completeness of 65,00.

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Third Cycle

a) **Problems**

Problems that occurred in the previous cycle is the second cycle that have not reached the completeness of learning and the learning process using NHT learning model that showed improvement but it has not reached a good level.

b) **Plan**

Based on the reflection on the second cycle, researchers continue action on the third cycle to improve execution of the second cycle. Researchers set up a scenario based learning lesson plans relating to the subject of Photosynthesis.

At the planning stage to do some remedial action is to clarify the delivery of content and use time as efficiently as possible so that the learning process can be accomplished in accordance with the scenario that had been developed.

c) **Implementation Actions**

In the third cycle, the teacher carry out learning scenario, learning plan. In addition, researchers who act as teachers also perform corrective actions have been planned with the teacher of biology based on the reflection on the second cycle.

d) **Observation**

Observation of student activities and teacher. The observations obtained through observation sheets completed by observer. Observations obtained from the observation of student activities for the wholw group and observation activities of teachers.

Based on the results of study on the third cycle of 67,39 with a sufficient criterion, then the implementation of learning on the third cycle was stopped because of the value of learning completeness of 65,00.

e) **Reflection**

On first cycle the average biology student learning outcomes 54,42, better 23,82% than the basic value of 43,95 with less criteria. In the second cycle the average value of the study of biology student increased 3,84%, from 54,42 to 56,51 with a lack criteria and scores an average increase of 18,38 points obtained with sufficient criteria. Then on the third cycle the average value of student learning outcomes up 19,25% from 56,51 to 67,39 with sufficient criteria and score an average increase of 23,26 points obtained with good criteria.

Observations using the observation showed that the activity of students and teachers from the first cycle until the third cycle has increased. In the first cycle, the activity of teachers considered less and less activity of the students assessed. This is because the researchers who act as teachers and students are still adjusting to the learning model is applied. In the second cycle of the activity of teachers were considered sufficient, as well as student activity assessed fairly. In the third cycle, the activity increased with the teachers well, while the activity of the students scored well. The increased activity of teacher and student activities are better implemented illustrates that learning has developed and implemented to continue to make improvements so that the applied learning can improve student collabotation that will ultimately have a positive impact on the biology student learning outcomes.

At the stage when the teacher calls answering student numbers (1, 2, 3, 5, or 5) and students with the relevant numbers to answer questions that have been prepared by a teacher without getting help from other students has increased. In the first cycle, students are still asking his friend when the answer and write on the board there are 9 students from 14 students who called the number. In the second cycle, students are asked his friend when the answer and write on the board there are two

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students from 14 studenta who called the number and the third cycle students called the number as many as 15 students and their own work on the board without having to ask other friends. To minimize the shortcomings of the study using a model of the NHT teachers prepare students with any number you want to call that represent different groups and marked so as not called twice so that all students can answer questions answering.

Based on the results of study on the third cycle of 67,39 with a sufficient criterion, then the implementation of learning on the third cycle was discontinued because of the value obtained has reached the value of learning completeness of 65,00.

DISCUSSION

Based on the research results can be seen that the data collected in compliance and accordance with the indicators and observation guide format. Before implementing the learning using the learning models Number Head Together in the first cycle was first introduced the learning to students, that learning will be implemented differently by learning the usual place. The NHT learning model begins with a brief presentation of the material, working LKS in groups as defined previously, then at every second meeting concluded with the provision of home tasks.

After three cycle of action, there is increased biological student learning outcomes that can be seen from the increase in the value of sudent learning outcomes or the average grade. According Dimyati (2002), an increase in the mean change in the ability to learn in a better direction and quality. Learning that takes place during the study succeeded in improving student learning outcomes, if there has been an increase in the average student at the end of each cycle.

The basic values of the first cycle is the average value of daily tests students on the subject of organ structure and function of plants. In the second cycle the base value is the value of the learning first cycle. In the third cycle is the basic value is the value of the learning second cycle.

First Cycle

Implementation of the learning process in the first cycle considered still lacking. This is because students and teachers are still adjusting to the learning process using NHT learning model. In this cycle is still adjusting state classroom teacher to do the learning process using a model of NHT and student learning to adjust to learning the NHT models, so that the necessary improvements in the next cycle to improve student learning outcomes the completeness learning.

Compared with the measures before the class, in the first cycle saw an increase of learning outcomes has not been achieved despite the completeness of learning. This is seen in an average increase in student learning outcomes from baseline of 43,95 to 54,42 with an average percentage increase in student learning outcomes by 23,82%.

The results obtained for each group studied a group E has less criteria once. Group A, B, D, G, H, I, and J have less criteria and group C and F have enough criteria. This illustrates that the average overall learning outcomes for the entire group is still quite lacking. Cooperation within the group is still very minimal to solve existing problems, especially in solving tasks done in groups.

Points indicates an increase in the amount of increase in student learning outcomes obtained. Overall, with an average 23,02 point increase in student learning outcomes assessed properly. To point increase in each group, the majority of both groups were assessed even point increase for the group C, F, G, and H rated very good, although there is still a group that was considered quite the group B.

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Overall these results indicate that there has been a good learning results improved compared with baseline.

Answering the first cycle is not executed well by the students, this is because of the 14 students who called her number by the teacher to come forward and answer questions on the board there are 9 students who do still ask other friends.

Based on the results obtained at 54,42, researchers and classroom teachers together to consider the need to proceed to the second cycle because the student has not reached a value of 65,00 completeness learning by doing counseling to students who really have difficulty in completing the worksheets and motivate students to ask questions if unclear, so that students are motivated to get better results than before.

Second Cycle

Implementation process of learning in the second cycle were considered sufficient. At this cycle students begin learning models used to study the NHT and has begun active in each group. Teachers are also increasing, especially in the mastery of classroom management and guiding students during the learning process as well as group work.

In the second cycle the average increase student learning outcomes, although not significant in the amount of 56,51 from the average of the learning first cycle of 54,42 with a large percentage increase is 3,84%. For each study the results obtained for the F group still has enough criteria. For group A, B, C, D, E, G, H, I, and J have less criteria. From first cycle to second cycle can be said that has not been an increase in learning outcomes significant because the whole group was considered.

Points showed an increase in the amount of increase in student learning outcomes obtained. Overall, with an average 18,38 point increase in student learning outcomes assessed fairly. Group D has good criteria and group A, B, C, E, F, G, H, I, and J have a sufficient criterion.

Answering the second cycle began to experience improvement, this is because of the 14 students who called her number by the teacher to answer questions on the board there are only two students who are still asking the others.

Based on the results obtained at 56,51 in the second cycle it is necessary to proceed to the third cycle to reach a value of 65,00 completeness study, with improvements in both the teacher and the students.

Third Cycle

Implementation of the learning process in the third cycle rated as good. Improvements in second cycle shortage of them in the delivery of learning and motivation have increased so that the average student learning outcomes increased by 67,39 and has reached the completeness of learning.

In the third cycle the average value of student learning outcomes have been achieved completeness learn the value of 65,00. The average increase in student learning outcomes can be seen in the first cycle mean the biology student learning outcomes 54,42, better 23,82% than the basic value of 43,95 with less criteria. In the second cycle the average value of the study of biology students increased 3,84%, from 54,42 to 56,51 with less criteria. Then on the third cycle the average value of student learning outcomes up 19,25% from 56,51 to 67,39 with sufficient criterion.

Criteria for increasing student learning results obtained can be seen through the points increase. Overall, with an average 23,26 point increase in student learning outcomes assessed properly. To point increase in each group, all groups are good, even for groups C, F, G, H, and I

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already have a very good criteria. Group A, B, D, and J have good criterion and group E has enough criteria. These results suggest then an increase the learning to said is good.

Answering the third cycle has improved the well, this is because of the 15 students who called her number by the teacher to write the answers on the board that no asked her friend. Students have started to work on his own on the board without asking fo help from his friends.

The results of this study show that the learning of biology through the application of learning models NHT can increase the average value of 67,39 for student learning outcomes in third cycle and has reached a value of 65,00 completeness learning. So the researchers decided to stop along observer learning to third cycle.

Based on the results of the three cycle study shows that learning activities have increased in each cycle, which is an average student and teacher activities in the first cycle belong less, in the second cycle the average student and teacher activities increased to fairly and on an average third cycle activities of students and teachers to increase to well. With the improvement of learning done in each cycle also affects student learning outcomes are:

a. Graph the results of biological studies describe an increase in the value of student learning outcomes biology students ranging from fundamental value, the value of first cycle, the value of second cycle to the value of learning outcomes third cycle. The increase occurred from baseline 43,95 to reach a value of 67,39. Graph improved learning outcomes of students after learning the biology of learning models NHT can be seen in Figure 2.
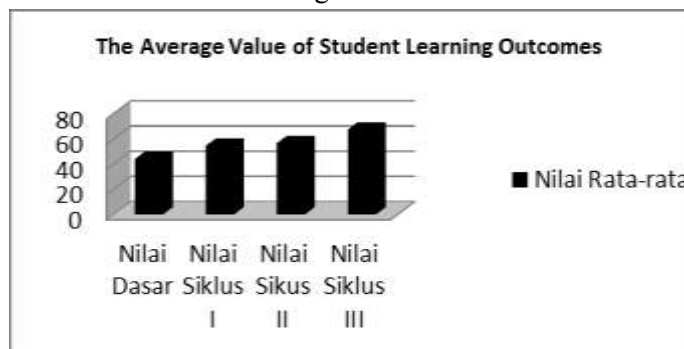

Figure 2. Improved Graph Biology Student Learning Outcomes

The average overall learning outcomes in the first cycle mean the biology student learning outcomes 54,42, better 23,82% than the basic value of 43,95 with less criteria. In the second cycle the average value of the study of biology students increased 3,84%, from 54,42 to 56,51 with less criteria. Then on the third cycle the average value of student learning outcomes up 19,25% from 56,51 to 67,39 with sufficient criterion.

b. Graph points increase ain students learning outcomes describe the improvement of biology ranging from basic values, values first cycle, the second cycle to third cycle the value of learning outcomes. The increase was from 23,02 points to reach 23,26 points. Graph improved learning outcomes of students after learning the biology of learning models NHT can be seen in Figure 3.

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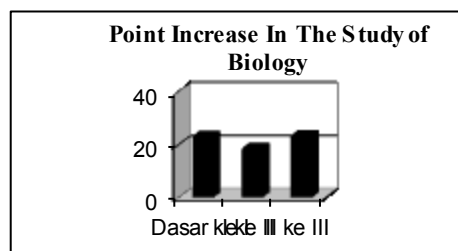
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Figure 3. Graph Point Improved Student Learning Outcomes Biology

Point increase in the learning of biology students from the baseline to first cycle is 23,02 points with good criteria, from first cycle to second cycle is obtained by 18,38 points with sufficient criteria and from second cycle to third cycle of 23,26 points with the criteria good.

c. Answering stage during the learning process experienced a considerable increase of the first cycle was still a lot of students answer questions on the board to ask other friends and in the second cycle has increased by decreasing the student who asked his friend when answering questions on the board and on the third cycle there is no student who asked his friend when answering questions on the board.

d. Activities of students during the learning process experienced a considerable increase of the first cycle, which is still considered less than increased in the second cycle to be enough and increased again in the third cycle to be good.

CONCLUTION AND REMARK

Conclution

Improved results of biological studies on the subject of Photosynthesis at class VIII in Junior High School 7 Samarinda in learning 2012/2013 can be described as follows:

- In first cycle, the average value of the study of biology students increased by 23,82% from baseline by 43,95 points to 54,42 with an average increase of 23,20 points.
- In second cycle, the average value of the study of biology students increased by 3,83% of the value of the learning first cycle by 54,42 points to 56,51 with an average increase of 18,83 points.
- In third cycle, the results of biological studies of students increased by 19,25% of the value of the learning second cycle by 56,51 points to 67,39 with an average increase of 23,26 points.

Suggestion

Based on this research, it can be suggested as follows:

1) Teachers are expected to be more active to motivate students in the learning process so that it can work with other students in improving the social relations among students.
2) Teachers are expected to apply the learning model Number Head Together (NHT) to improve the effectiveness of learning in the classroom and to improve student learning outcomes biology.
3) Further research is needed to improve the quality of teaching and student learning outcomes by applying models of learning to other.

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