APPLICATION OF STAD LEARNING MODEL ASSISTED MACROMEDIA FLASH IN HUMAN BLOOD CIRCULATION SYSTEM MATERIAL

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ABSTRACT

This research is a Classroom Action Research (CAR) which is done in 2 cycles. The aim of this research is to know the application of cooperative learning model type STAD with macromedia flash in learning material about human blood circulation system to improve students' learning result.

Method in this research is qualitative method. The result of research shows that in teaching and learning activity, the activity of teacher in cycle I showed good and very good criteria with percentage 96.15% and the students' activity showed good and very good criteria with percentage 73%. In the cycle II both of the teacher's activity and the students' activity got good and very good criteria with percentage 100%.

The learning result in the cycle I, 57.89% of students got point under 70, in the cycle II got increase become 89.47% for the students' who can pass the activity. Thereby, it can be concluded that by using cooperative learning model type STAD with macromedia flash can improve the students' learning result in learning material about human blood circulation system.

Keywords: Cooperative Type STAD, Macromedia Flash, Students Learning Result

INTRODUCTION

Senior High Schools and Madrasah Aliyah (MA) are held with the aim of increasing intelligence, knowledge, personality, noble character, and skills to live independently, develop attitudes and abilities and provide knowledge to live in society and follow further education. One of the subjects taught in Senior High School to prepare students, in realizing these goals is a subject in biology.

Biological materials, discuss a lot about the natural environment and its symptoms. Therefore, every teacher must ensure the quality of the learning process in the classroom especially in teaching biology material. The teacher must be able to make the class more active so that students are motivated in learning, there is reciprocal interaction between the teacher and students or fellow students.

The essence of learning is the process of changing behavior. This provides information that learning must be based on changes, within a certain period of time. Changes in behavior indicate that a learning process has occurred. Learning is defined as the modification or strengthening of behavior through experiencing [3], and learning is a psychophysical activity leading to the formation of a complete personality, and a process that involves forming meaning by students from what they do, see & hear [8], [2]

The various definitions of learning above, it can be concluded that learning does not happen immediately, but has gone through the learning design stages. The various definitions of learning above, it can be concluded that learning does not happen imme

diately, but has gone through the learning design stages. learning is a process of mental change that creates new skills, through hard work in a continuous process.

In the learning process, the students ha ve the abilities after receiving their learning experience. Individuals who learn will get the results of what they have learned, during the learning process. Learning result are changes that occur in individuals who learn, changes in their knowledge, and their behavior changes compared to previous behavior [4].

However, from the benefits of studying above. There are also many teaching and le arning situations that are less effective and less conducive when found in the classroom. For example, a teacher does not utilize learning resources optimally and ignores le arning media in carrying out learning, even though the media is very functional to increase student motivation and improve student learning result.

The above symptoms occur because so far, the teacher has been unable to attract students to pay attention in their teaching. Teachers are often engrossed/busy in explaining without giving the opportunity to ask questions or be asked to students [5]. "The factors that influence learning, namely:1) Student background; 2) professional teachers; 3) Participatory and interactive learning atmosphere which is manifested by the existence of reciprocal and multiway communication (multiple communication) that is active, creative, effective, innovative, and fun; 4) Facilities and infrastructure that support the process, so that students feel at home and excited (enthuse) to learn; 5) The curriculum as a basic framework or direction, especially regarding changes in behavior of students integrally, whether related to cognitive, effective, or psychomotor; 6) The environment of religion, social, culture, politics, economy, science and technology, and the surrounding environment; 7) A healthy, participatory, democratic, and situational learning leadership atmosphere that can build intellectual happiness; 8) Adequate financing".

Therefore, a teacher can think about and make good plans in increasing learning opportunities for students by improving the quality of learning. Learning is the develop ment of new knowledge, skills or attitudes, as the child's personal reciprocal interaction with information in the learning environment, takes place over time [6]. Teaching is a process of regulating, organizing the environment around students, so that it can grow and encourage students to carry out the learning process. Good teaching quality will create feedback as expected by the teacher and will achieve the planned learning objectives [12].

Based on the results of observations and interviews with the biology teacher at MA Al-Khairaat Kiyai Modjo, there are some materials that are difficult for students to understand, one of which is the human circulatory system, because this material in cludes the parts in the body and the circulatory mechanisms, which are still difficult for students to understand. In addition, the learning process in the classroom is more dominated by teachers, without any feedback. As a result, the learning process does not get better learning result.

Table 1, Evaluation Value of Circulatory System Material Class XI MA Al-Khairaat Kiyai Modjo

No	School Year	Semester	Evaluation Value (%)
1	2010-2011	Ganjil	51%
2	2011-2012	Ganjil	67%

(Source: MA Al-khairaat Kiyai Modjo)

The factors that make the learning result of class XI IPA MA Al-Khairaat Kiyai Modjo students decrease are the learning methods implemented by the teacher are still one-way and conventional, namely a teacher still plays a role as an information center and not as a facilitator, learning depends on handbooks, use of charts or white

board and teachers are less skilled in using technology media in learning such as computers and LCDs. These factors cause less attractive learning for students, and if this learning method is maintained and implemented repeatedly, it certainly will not motivate students to learn and make students become bored of learning biology.

One learning model that can improve learning result, student-centered learning, and make it easy for students to understand the circulatory system material, is by using the STAD (Student Teams Achievement Divisions) type of cooperative learning model. STAD aims to encourage students to discuss, help each other complete assignments, understand and master concepts. STAD learning model is a cooperative learning method that is more concerned with the attitude of student participation in developing cognitive and affective potential.

The advantages of STAD are: 1) It is relatively easy to organize. 2) Able to motivate students in developing individual potential, especially creativity and responsibility in improving the image of the group. 3) Train students to work together and help each other in groups. 4) Students are able to convince themselves and others that the goals to be achieved depend on their performance, not due to luck. 5) Students are more able to communicate verbally and non-verbally in collaboration. 6) Increase the familiarity of students [13].

In addition to using a learning model, it is also important for a teacher to use animation media in the teaching and learning process in class to make it more enjoyable. One of the animation media that is very interesting and concrete is Macromedia Flash because this media can make the learning process interesting and provide learning motivation for students. Macromedia Flash has the advantage, namely It has an interactive side and can receive input users [1].

Based on the above problems, the authors are interested in conducting research, in the form of Classroom Action Research (CAR) to improve student learning result in the human circulatory system material, through the use of STAD type cooperative learning model assisted by macromedia flash The purpose of this collaborative learning model and media is to determine the effectiveness of the application of the type STAD model assisted by macromedia flash, and also to find out the learning result of class XI students of MA Al-Khairaat Kiyai Modjo human blood circulatory system material.

RESEARCH METHODOLOGY
Location and Time of Research

This research was conducted at MA Al-Khairaat Kiyai Modjo, which is located at 41 Kiyai Modjo Street, Ombulo Village, Limboto Barat Sub-District, Gorontalo District, Gorontalo Province. The research subjects were 20 students of class XI IPA consisting of 9 boys and 11 girls. This Classroom Action Research (CAR) was carried out in the odd semester of the 2012-2013 academic year with an allocation of 10 lesson hours divided into 4 meetings.

Research procedure

This research refers to a classroom action research procedure which is carried out in a cycle, by going through the following stages [9]:

Cycle I
a. Preparation Step (Planning)

The activities carried out in the preparation stage are: (1) coordinating with the principal, requesting permission and approval to conduct research, (2) conducting discussions with biology teachers at the school who participate in the implementation of classroom actions, (3) compiling learning scenarios for each cycle, (4) compiling observation sheets for teacher and student activities, (5) preparing pre-test, quiz and post-test questions were given at the end of each cycle.

b. Action Step

Carry out the action according to the learning plan that has been prepared. The sequence of activities in general follows

the steps of the STAD cooperative learning model as follows:

Step 1 : Pre-test
Step 2 : Form a group
Step 3 : Present the lesson
Step 4 : Give a group assignment
Step 5 : Students explain the assignment/question
Step 6 : Give a quiz
Step 7 : Give awards
Step 8 : Evaluation (posttest) & closing

c. Observation and Evaluation Step

Observation of learning process activities is carried out by observers with an observation sheet of learning process activities containing aspects to be observed during activities namely observations of teacher activities and observations of student activities. Observations are made during the learning process, and learning evaluation is carried out at the end of each cycle.

d. Analysis and Reflection Step

Data analysis will be carried out in a quantitative description by paying attention to the data obtained from the results of observations and evaluation results. After analyzing the data, it was followed by a reflection of the observation data and the results of the evaluation of learning. This aims to see the determined performance indicators have been achieved or not. If there is performance that has not been achieved, it will be fixed and planned for the second cycle.

Cycle II

Cycle II is carried out as a follow-up research action that aims to fix problems that are still encountered in cycle I. Action in cycle II, the procedure is the same as the procedure in cycle I includes 4 steps: planning, action, observation and evaluation, analysis and reflection.

Data collection technique

The data collection techniques used in this study are as follows:

The test

The tests conducted in this study were in the form of a pre test to obtain an initial score, a quiz and a post test to obtain a final score. These three tests aim to determine the best group, and assess students' understanding of the material taught in each meeting or lesson. The results obtained by students will be calculated using the formula:

$$\text{Result Obtained} = \frac{\text{Score Obtained}}{\text{Ideal Score}} \times 100\ \%$$

Observation Sheet

Observation aims to determine the suitability between the planning and implementation of the researcher's actions in applying the STAD (Student Teams Achievement Divisions) model assisted by macromedia flash. Observations are carried out by observers using observation sheets, which consist of teacher observations and student observations. The results of student and teacher observations are calculated using the following formula:

$$\text{Result Obtained} = \frac{\text{Score Obtained}}{\text{Ideal Score}} \times 100\ \%$$

Questionnaire

This questionnaire is given to all students after all learning actions are completed. The form of questions used in this questionnaire is a check list and placing a check mark according to the instructions given by the researcher.

The results of this questionnaire will obtain data regarding the student's response to the application of the STAD-type cooperative learning model assisted by macromedia flash on the material of the human circulatory system. The student response is calculated by the following formula:

$$\text{Average Score} = \frac{4\ VG + 3\ G + 2\ D + 1\ VD}{n}$$

Information:
VG (Very Good)   : score 4
G   (Good)   : score 3
D   (Deficient)   : score 2
VD (Very Deficient) : score 1

The total score for each statement is divided by the number of students who filled out the questionnaire and the result is called the average score. To determine student responses, the following criteria are used. Response Criteria:

3 ≤ mean score < 4 = very positive
2 ≤ mean score < 3 = positive
1 ≤ mean score < 2 = negative
0 ≤ mean score < 1 = very negative

RESEARCH RESULTS

In the Cycle I some students showed learning completeness which was still below the MCC (Minimum Completion Criteria) MA Al-khairaat Kiyai Modjo, namely 80, with several aspects of student and teacher activities that were not carried out properly and maximally. In addition, in Cycle II student learning result that have been completed have increased and several aspects of teacher and student activities have been carried out optimally. To find out student learning result and the achievement of learning activities in class can be seen in Table 1 below.
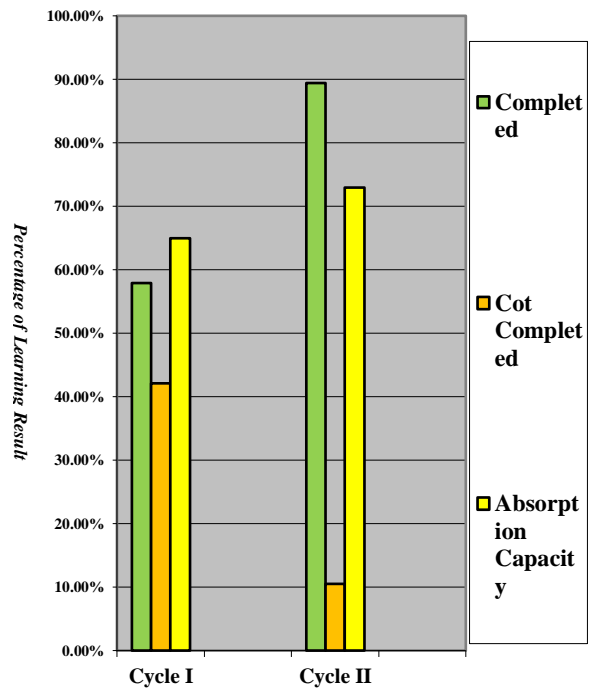
Table 1

Comparison of Value Acquisition (Student Learning Result) Cycle I and Cycle II Class XI MA Al-Khairaat Kiyai Modjo on the material of Human Circulatory System.

Category	Cycle I	Cycle II
Completed	57,89% (11 students)	89,47% (17 students)
Not Completed	42,11% (8 students)	10,53% (2 students)
Average Score	69 (19 students)	78.84 (19 students)
Absorption Capacity	65% (19 students)	74,87% (19 students)

Based on the total scores from the results of the assessment of observer 1 and observer 2 regarding the implementation of teacher learning, the following table shows the results of the converted learning implementation criteria.

Figure 1 Graph of Comparison of Value Acquisition (Student Learning Result) Cycle I and Cycle II.

Table 2

Observation Results of Teacher Learning Activities Cycle I and Cycle II

Cycle	Asesment Criteria				Information
	VG	G	D	VD	
I	69,23%	26,92%	3,85%	-	- Predicate teacher activity has not been successful - 2 aspects of teacher activities are not optimal
II	89,6%	10,4%	-	-	- Predicate successful teacher activity

(Source: Field Research, 2012)

Based on the total score of the results of the assessment of observer 1 and observer 2 regarding the activities of students in implementing the Macromedia Flash based STAD model, it can be shown in Table 3.

Table 3
Observation Results of Student Learning Activities Cycle I and Cycle II

Cycle	Asesment Criteria				Information
	VG	G	D	VD	
I	56.5%	16,5%	27%	-	- Predicate student activity has not been successful - 6 aspects of student activities are not optimal
II	89,6%	10,4%	-	-	- Predicate successful student activity

(Source: Field Research, 2012)

DISCUSSION

Observation the implementation of the STAD Type Cooperative Learning Model Assisted by Macromedia Flash in Class XI Students of MA Al-Khairaat Kiyai Modjo

The implementation of the STAD type cooperative learning model in teaching biology material at MA Al-khairaat Kiyai Modjo, is in accordance with the steps, namely before presenting biology material, the teacher makes presence & provides motivation. Furthermore, the teacher explains the rules and objectives of the pre-test, which is to measure students' prior knowledge. Further more, the teacher divides the students into 4 heterogeneous groups, each of which consists of 5 students. The method of group division according to the STAD (Student Teams Achievement Divisions) learning strategy is cooperative learning strategy using heterogeneous small groups based on different academic abilities, gender, and ethnicity [11], [2].

After being divided into groups, the discussion of the material was introduced first in the STAD type learning model, then the teacher presented the material assisted by interactive learning media (audio-visual) such as macromedia flash. This method will help students recognize the need for full attention during class presentations and can assist them in taking the quiz.

The next step is for the teacher to share the previously prepared discussion topics with each group that has been formed [11]. "The STAD method of cooperative learning materials is designed in such a way for each group. Before presenting the learning material, an activity sheet (discussion sheet) is made and an answer sheet for teamwork".

During a group discussion on the material of the human circulatory system. The teacher provides reinforcement and guides the group discussion, that to get good group points, each member must share knowledge and help each other or work together.

After each group has finished its discussion topic, the teacher appoints a representative from each group to present the results of the discussion, and the other groups listen, give responses and rebuttals. Furthermore, after the presentation and discussion, the teacher asks one of the students to conclude the subject that has been discussed at that time.
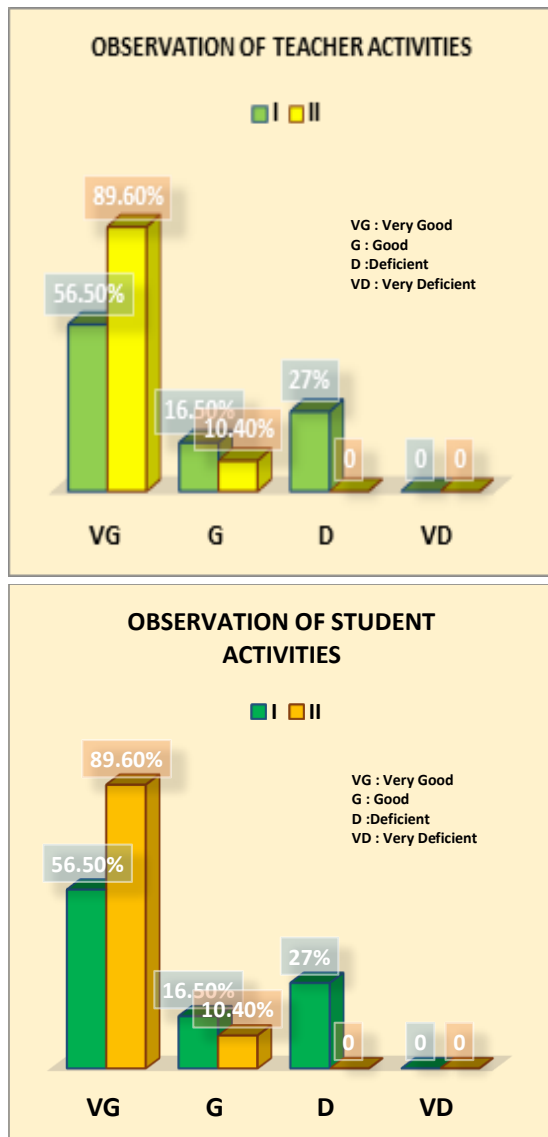
The next step The teacher instructs students to return to their original place to allow them and not to allow students to work together when working on the quiz. Then the teacher distributes question sheets (quiz) to students and gives time to solve questions. [11] "During the discussion, students are not allowed to help each other in doing the quiz, so that each student is individually responsible for understanding the material that has been studied".

The last step that is always carried out at the end of the lesson is that the teacher provides recognition or rewards for the Super Team, namely the group that has the highest points of progress because it has completed the quiz properly and correctly. The team is very good and the Good Team is also given a reward by the Teacher. Giving rewards to superior groups will greatly motivate students to be the best and continue to excel. [11] "... A teacher must give recognition or awards for the achievement of the Super Team, such as a big and attrac-

tive certificate, a medium certificate for the Excellent Team, and a small certificate for the Good Team, because this will please the students for their good achievement. they make".

Figure 2
Graph of observation of teacher activities, Class XI students in the implementation of the STAD learning model, assisted by macromedia flash Cycle I & Cycle II

OBSERVATION OF TEACHER ACTIVITIES

VG : Very Good
G : Good
D :Deficient
VD : Very Deficient

OBSERVATION OF STUDENT ACTIVITIES

VG : Very Good
G : Good
D :Deficient
VD : Very Deficient

Some of the things that became obstacles were not achieved in student learning result in cycle I, which could be analyzed from the results of observations of student activities in cycle I, among others: 1) The students were not used to using the STAD learning model, for example most students

still looked chaotic when dividing groups; 2) Some students pay less attention to the material being taught and cannot cooperate in discussing discussion topics. Even though discussion is an important part of the learning process so that students are responsible for completing discussion assignments; 3) When completing the pre test some students cheated on their classmates, this indicated that the students were not thought to be ready to take part in learning; 4) In addition, teachers are still lacking in motivating students during the teaching and learning process, or in terms of providing reinforcement to each student and study group; 5) Teachers are still not supervising the course of discussions; 6) Teachers are lacking in guiding small group discussions so that it affects students in completing assignments.

Based on the results of observations of student and teacher activities above, it is very necessary for researchers to follow up on aspects that are not optimal in cycle I, because learning that is not carried out properly will create learning result that are not optimal. However, after the follow-up was carried out regarding improvements. Student learning result showed the optimal completeness value in cycle II, and all aspects of student and teacher activities in learning were carried out well.

From the activities of teachers and students during the application of the STAD Learning Model in cycles I and II, it can be seen that the significant results of the five main components in the STAD learning model are:
1. Class presentation results, Class presentation by the teacher using verbal or non verbal presentations, and is focused on the concepts discussed. Students work very hard in discussing the material.
2. The results of the determination of students in the discussion Students are cooperative in achieving the academic abilities expected by the teacher. STAD gro

ups are mutually assured and there is no conflict between members in one group.

3. Quiz Results, the results of individual quizzes after one and two presentations were carried out, students worked and practiced in groups. Students who are motivated give excellent results for group success.

4. Individual score results, the pre and post individual improvement scores were very satisfying The average student scores well above the minimum completeness criteria standard (MCC).

5. Results of group recognition, after being given an award for the achievements of each group. They are very motivated & enjoy learning with the STAD learning model.

STAD Learning Model has advantages namely: can develop student achievement, both teacher-made test results and standardized tests. Students' self-confidence increases, students feel more in control of their academic success. The cooperative strategy provides an impressive development of interpersonal relationships among members of different ethnic groups [9].

Until now, the STAD method of cooperative learning has not been widely applied in our education. Most educators are reluctant to implement this system for several reasons. [7] The reasons for teachers are reluctant to implement cooperative learning in class are:

1. Concern that there will be chaos in the classroom and students do not learn if they are applied in groups.

2. Many people have a negative impression about collaborative activities or studying in groups.

3. Many students resent being told to cooperate with others.

4. Students who are diligent feel they have to work more than other students in their group, while students who are less able to feel inferior are placed in a group with students who are smarter.

5. The students who are diligent also feel that their underprivileged team is only riding on the results of their hard work.

Student learning result, class XI MA Al-Khairaat Kiyai Modjo on the material of the human circulatory system

Learning Result are one of the goals to be achieved in the learning process, because learning result are an indicator that reflects the quality of education. Less attractive and less interactive learning atmosphere is more influenced by the application of teacher-centered conventional learning. This can hinder students' efforts, in obtaining optimal learning result, and cannot increase student motivation in accepting the material taught by the teacher.

Based on the results of the evaluation in cycle I, student learning result have not been achieved optimally according to the expected completeness standards. Students who scored above 70 were 11 students with a percentage of 57.89% and students who obtained grades below 70 were 8 students or with a percentage of 42.11%. The class average value obtained by students in the first cycle was 68 with 65% student absorption. So it can be concluded that the learning result of students in cycle I have not yet reached completeness.

After doing follow up improvements in cycle II. The results of the second cycle evaluation showed optimal results, and all aspects of student and teacher activities showed significant improvement. The learning result of students in cycle II, who obtained a value above 70 were 17 students with a percentage of 89.47% and students who obtained a score below 70 could be measured by a percentage of 10.53%, with a class average value of 78.84. and student absorption increased to 74.87%.

The achievement of optimal learning result by students, due to improvements made in cycle II, among others: 1) The teacher further enhances the good learning process; 2) Good pre-test results illustrate to the teacher that the students are very ready and

enthusiastic in participating in learning activities; 3) Students help each other & work together in completing group assignments; 4) All groups have been active and each group is competing to be the best; 5) The students were very enthusiastic about doing the evaluation test, and did it correctly and thoroughly; 6) Reflection of the material is carried out effectively.

CONCLUSION

Based on the results of the research and discussion above, it can be concluded that:

1. Learning that is carried out with STAD learning model integrated with macromedia flash has different learning outcomes in each cycle, and these results indicate that student learning outcomes increase in the material of the human circulatory system.

2. MA Al-khairaat Kiyai Modjo has not been accustomed to using the STAD learning model, therefore researchers are trying to make changes by getting used to implementing the STAD learning model assisted by macromedia flash media.

3. The learning outcomes of class XI MA Al-Khairaat Kiyai Modjo after the application of the macromedia flash assisted STAD learning model increased from 57.89% (11 students) to 89.47% (17 students).

4. Observation of classroom actions in cycle II, student learning activities increased after improvements were made in cycle I. The same thing was shown by the response of students to the application of the cooperative learning model type STAD was very positive. This learning can foster cooperation, mutual trust, cooperation in groups, foster leadership,

be active in opinion and respond to material discussed.

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