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IMPLEMENTATION TEAM ASSISTED INDIVIDUALIZATION LEARNING MODEL ASSISTED BY WORKSHEET BASED ON CONTEXTUAL TEACHING AND LEARNING TO IMPROVE STUDENT LEARNING OUTCOMES

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Abstract

The purpose of this research was to describe the increase in learning outcomes through implementation of Team Assisted Individualization learning model assisted by student worksheet based on Contextual Teaching and Learning on human circulatory system. This research was used a One Group Pretest-Posttest Design. This research was conducted on 36 students of SMP Negeri 32 Surabaya. The learning activity in this research got 4 in modus which belongs to good criteria. The results of learning outcomes in the form of knowledge competencies in this research was obtained from the results of the N-Gain test which showed that 64% of students belong to the high category and 36% of students obtained scores that belong to the medium category. The learning outcomes in the form of students knowledge competencies were known from the students pretest and posttest score. The results of the student posttests increased after the implementation of Team Assisted Individualization learning model assisted by student worksheet based on Contextual Teaching and Learning. The results in the form of learning skills competencies were obtained an average score of 85 which belongs to good criteria at the first meeting and 87 which belongs to very good criteria at the third meeting. This research received 96% positive responses from the students. The conclusion of this research is that the implementation of Team Assisted Individualization learning model assisted by student worksheet based on Contextual Teaching and Learning on human circulatory system material able to improve students learning outcomes.

Keywords: Team Assisted Individualization, Contextual Teaching and Learning, Learning Outcomes

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INTRODUCTION

Education plays an important role in ensuring the national development. Through education, it is hoped that it is able to produce high quality humans and plays an active role in the progress of a nation. Schools as formal educational institutions have a sufficiently huge responsibility to improve the quality of students. In improving student learning achievement, cooperation between teachers, students, schools, parents and the government is needed (Mustika, 2016).

The improvement of student learning outcomes is related to the learning situation in the classroom. Learning activities should occur in a two-way interaction between students and teachers. As a result, not only listen to the teacher, but the students should also think actively when learning takes place. Teacher skills in delivering material can affect student learning outcomes. In order to deliver lessons properly a teacher must master the lessons, besides that the teacher must be able to choose a learning model that is in accordance with the existing situation and conditions as well (Iskandar, 2012).

The right learning model can make it easier for students to understand learning material. In choosing a learning model, there are several things that need to be considered, one of which is the difference of student abilities. Each student has a different level of ability and absorption of the lessons. There are students who have low abilities, moderate abilities, and high abilities. One of the learning models that can be used is the Cooperative Learning Model. This is because students are able to discuss and learn from one another. Cooperative Learning Model is a learning model that allows the learning process among fellow students. So that one-way learning that is merely teacher centered does not occur (Rahmah, 2006).

Cooperative learning has several advantages. The advantages of cooperative learning according to Hill & Hill (in Suryani 2010) are students are not too dependent on teachers, but it is able to increase confidence to think by themselves, students are able to find information from various sources, students are able to learn from one another, improve student achievement, understanding, train the students to be more responsible in learning, please the students, develop leadership attitudes, develop positive attitudes of the students, train students to respect others. There are several types of cooperative learning models, one of which is Team Assisted Individualization.

According to Mardeni (2013) Team Assisted Individualization is a learning model by forming groups of students with different levels of ability, where clever students can teach other students who need help. So that students with high abilities are able to develop their abilities and poor students are able to be helped to overcome the learning difficulties they face. This is in line with Tinungki (2015) Team Assisted Individualization is group learning that divides students into small groups consisting of two or more students who help each other in learning.

Previous research conducted by Isa (2017) showed that classes taught by implementing Team Assisted Individualization learning model produced higher N-Gain than the control class. In addition, there is also research by La Rudi (2015) which proves that Team Assisted Individualization learning model is able to improve student learning achievement.

In Team Assisted Individualization learning model, the teacher is only a facilitator in the class to guide students to the knowledge they learn. As according to Muntari (2018) Educators are enough to seek the condition of a conducive learning environment for students. Cooperative learning TAI is a learning that handle students to solve problems given by teacher in small groups. This type of learning requires students to participate actively in the classroom.

The learning process in the classroom requires supporting tools so that students are able to understand science concepts well. One of the efforts that is able to be done is by providing Student Worksheet (LKPD). The student worksheet applied to this research is based on Contextual Teaching and Learning, which focuses on active student participation in order to be able to find the material being studied, then connect and apply the material in everyday life (Sanjaya, 2016).

Research conducted by Santoso (2013) stated that the use of Team Assisted Individualization learning model with Contextual Teaching and Learning approach is able to improve student achievement. This is in line with Bakhorudin (2013) who stated that Team Assisted Individualization learning model has the same theoretical basis as Contextual Teaching and Learning approach, which is based on constructivism. In constructivism learning, knowledge is built by students independently and the teacher only acts as a facilitator. In this learning, not solely memorize the material, but the students also relate the lesson to real life which is able to add new skills and understanding, and it is hoped that student learning outcomes are able to improve.

In fact at school, the students' ability to understand the concept of the Human Circulatory

System is still quite low. The results of pre-research conducted by researchers at SMPN 32 Surabaya showed several reasons for students who have not understood science learning material, namely the teacher explained a lot by lecturing and often did not use learning props or learning media, and the teacher also did not direct students to apply learning material in real life.

According to Mastura (2017), low student learning outcomes are also caused by the learning model used in schools that does not invite students to actively participate in learning, thus reduces students' interest in learning. The teacher still explains a lot by lecturing so that students listen to the teacher's explanations less because they quickly feel bored. This can lead to less achievement of learning objectives and less optimal learning outcomes.

Whether or not learning objectives are achieved, it depends on the learning situation in the classroom, so it takes the teacher's ability to be skilled in choosing an appropriate learning model. Based on the results of pre-research conducted by researchers as many as 34 out of 40 students at SMPN 32 Surabaya stated that they were not satisfied with the science learning outcomes, so it was necessary to make efforts to improve student learning outcomes.

Based on the description above, the authors conducted research on the extent to which Team Assisted Individualization learning model is able to function optimally to improve student learning outcomes in Human Circulatory System material. To answer this problem, the authors conducted a study entitled "Implementation of Team Assisted Individualization Learning Model Assisted by Student Worksheet Based on Contextual Teaching and Learning to Improve Student Learning Outcomes".

METHOD

The type of research used was pre experimental design, namely research which only used one class without a comparison class. This type of research was chosen because researcher wanted to know the effect of the treatment applied for student learning outcomes. The design in this study used One Group Pretest-Postest Design. This research was carried out by giving a pretest to determine the initial ability of students, then it was given treatment by applying Team Assisted Individualization learning model and was finished by giving a posttest in order to know the increase in student learning outcomes.

The research design used is as follows:

Table 1. Design of One Group Pretest Postest Design

Pretest	Treatment	Posttest
O_1	X	O_2

(Sukmadinata, 2015)

Note:
O1 = Pretest is done before applying the *Team Assisted Individualization* learning model.
X = Treatment in the form of applying the model *Team Assisted Individualization* learning model.
O2 = Posttest is done after applying themodel *Team Assisted Individualization* learning model.

This research was conducted on 8th grade students at SMP Negeri 32 Surabaya. The subjects used in this study were 36 students of SMP Negeri 32 Surabaya. The data collection techniques used were (1) observation method; (2) test method and (3) questionnaire method.

Research instruments used for data collection were learning implementation sheets, student response sheets, pretest and posttest sheets to measure students learning outcomes.

Data analysis techniques in this study were (1) analysis of the learning implementation; (2) analysis of the student learning outcomes; (3) analysis of the student response questionnaires.

1. Analysis of the Learning Implementation

This analysis is based on the feasibility of learning during the learning process takes place, so that data is obtained from observers in the form of a Likert scale assessment score as shown in the following table :

Table 2. Criteria for Learning Implementation

Criteria for Assessment	Score
Bad	1
Enough	2
Good	3
Very Good	4

(Riduwan, 2015)

The learning implementation score that has been obtained is then analyzed using the mode method (scores that often appear). The scores that appear most often will be categorized as the implementation of the learning (Riduwan, 2015).

2. Analysis of the Student Learning Outcomes

Learning outcomes in the form of knowledge competencies owned by students are able to be analyzed by a normalized gain score. The following formula is being used :

$$<g> = \frac{post\ test - pre\ test}{skor\ \max - pre\ test}$$

Then the calculation is carried out using the equation above. The scores obtained by each student were converted using the following criteria:

Table 3. Criteria for Normalized Gain

N-Gain	Gain Criteria
$0,0 < g \leq 0,3$	Low
$0,3 < g \leq 0,7$	Medium
$g > 0,7$	High

(Hake, 2002)

Based on these criteria, Team Assisted Individualization learning model is able to be said to be effective for improving student learning outcomes if the results of student improvement reach > 0.3 score (Hake, 2002).

Assessment of learning outcomes in the form of skills competencies owned by the students is carried out by providing an assessment of students during the discussion while working on student worksheet which includes 4 indicators. The following formula is used to assess skill competencies :

$$\text{Skill Score} = \frac{\text{Score Obtained}}{\text{Maximum Score}} \times 100$$

3. Analysis of Questionnaire Student Responses Student

Analysis of the student response questionnaires results is able to be conducted by using the formula:

$$\text{Student responses (\%)} = \frac{\text{Score Obtained}}{\text{Maximum Score}} \times 100\%$$

If the answer chooses a positive response ≥61%, it is assumed that all students have a positive response to the statement provided (Riduwan, 2015).

RESULT AND DISCUSSION

This research was conducted on student learning outcomes on knowledge competencies and skills competencies. Assessment of learning outcomes was carried out to describe the improvement of student learning outcomes through the application of of Team Assisted Individualization learning model assisted by student worksheet based on Contextual Teaching and Learning.

The following is a recapitulation of learning implementation scores observed by observers during three meetings :

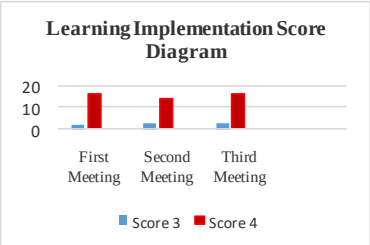

Figure 1. Learning Implementation Score Diagram

Based on figure 1. The learning implementation score diagram shows that at the first meeting 2 learning activities got a score of 3 and 16 learning activities got a score 4. At the second meeting 3 learning activities got a score of 3 and as many as 14 learning activities got a score 4. At the third meeting 3 learning activities got a score of 3 and 16 learning activities got a score 4.

The learning implementation was observed by the observer as a whole at the first meeting, the second meeting, and the third meeting obtained a mode score of 4. These results indicate that the learning activity can be carried out in a very good category. In this lesson the teacher carried out all learning activities from the introduction to the closing according to the Lesson Plan (RPP).

Assessment of learning outcomes in the form of knowledge competencies is analyzed by calculating the normalized gain score to be able to determine the increase in student learning outcomes. The results of the normalized gain can be seen in the following diagram :

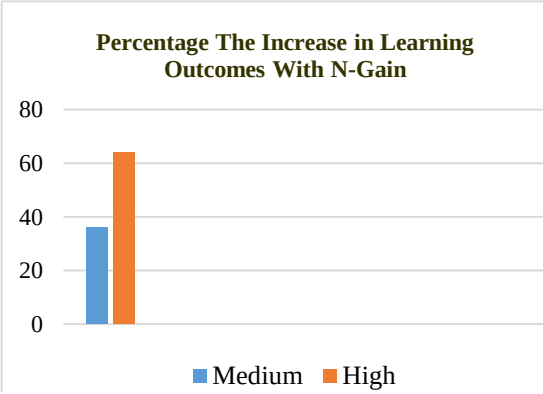

Figure 2. Percentage diagram of the increase in learning outcomes with the N-Gain

According to the Figure 2, there were no students belong to the low category, 36% of students belong to the medium category, and 64% of students belong to the high category. The category of student learning outcomes improvement with the N-Gain test is different from one another because the ability and absorption of each student is different. According to Triyuni (2016), it is stated that each student's cognitive abilities are different, so students need different guidance and time to be able to master a concept.

Student learning outcomes in the form of knowledge competencies have increased. This increase can be seen from the results of the pretest and posttest. Scores obtained by students at the pretest has shown that almost all of the answers were not thorough or below the Minimum Mastery Criteria (KKM). However, after students got learning that applies Team Assisted

Individualization learning model, as well as working on student worksheet based on Contextual Teaching and Learning, the students' posttest scores have increased. This is in accordance with La Rudi's (2015) statement that Team Assisted Individualization learning model can improve student learning outcomes.

The research conducted by Isa (2017) showed similar results that the class taught by applying Team Assisted Individualization learning model on Hydrocarbons produces a higher N-Gain than the control class. Sulistyaningsih's research (2015) also explained that the application of Team Assisted Individualization learning model on Chemical Equilibrium is able to improve student achievement.

Based on the results of the N-Gain test, it can be seen that there are no students who got a low percentage. However, in this study, there were some students who got medium and high N-Gain percentage. The difference in the percentage of N-Gain in medium and high categories can be influenced by factors such as differences in student abilities (Nurrafida, 2019).

In this study, Team Assisted Individualization was implemented and supported by a learning tool, namely the Student Worksheet. Student worksheet used in this study is Student Woksheet Based on Contextual Teaching and Learning, which focuses on active participation of students in order to be able to find the lesson being studied, then apply the lesson in everyday life (Sanjaya, 2016).

Online learning makes teachers have to be able to develop student worksheet that is able to support the ongoing learning. In this study, there were two activities in Student Woksheet based on Contextual Teaching and Learning which were carried out by students in groups. This student worksheet is done by students through discussing and exchanging information via WhatsApp group. The first activity is discussing in answering questions related to daily life and the second activity is conducting experiments in their own home. Then the results of each student's experiment were used as material for discussion in small groups.

The experiments conducted by the students were measuring heart rate after doing various activities. Then students were directed to analyze the effect of human activities on heart rate. This will make students realize that strenuous activity will increase human heart rate. It is because the heart pumps blood faster to meet the oxygen needs of the active body cells. It is hoped that students are able to apply the learning material in their daily life.

Assessment of learning outcomes in the form of skill competencies aims to measure student skills during learning takes place. The assessment of skill competencies is carried out to measure students' ability to apply the knowledge that has been acquired during the learning process. In this study, skill competencies assessed were the skills of students conducting experiments in accordance with the guidelines contained in the student worksheet.

The following is a diagram of the average scores of students 'skills in conducting experiments:

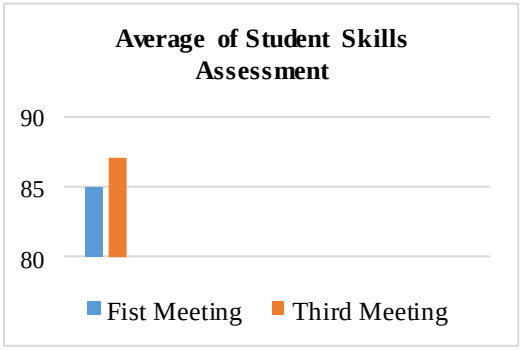

Figure 3. Diagram of Average Student Skills Assessment

Based on Figure 3. Diagram of average student skills asssessment can be seen from the average learning outcomes in the form of skill competencies in SMP Negeri 32 Surabaya, at the first meeting, the result was 85 which belongs to good category. And the average student learning outcomes of SMP Negeri 32 Surabaya at the third meeting was 87 which was belongs to very good category. Student skills learning outcomes are obtained through student assessments during the discussion while they were working on the student worksheet which includes 4 indicators, namely working according to the steps listed on the student worksheet, analyzing experimental questions, looking for relevant sources of information and concluding the results of the experiment.

When students held discussions to work on the student worksheet that has been given, group members exchange information and students with high abilities are able to express their opinions well. Then other students responded so that there was a discussion among members to find the best answer to the questions that had been provided in the student worksheet given. This can be observed because the researcher joined each WhatsApp groups, so that the researcher can oversee the the discussion in each small group.

According to Vygotsky in Slavin (2011) stated that cooperation between friends in a group will

make it easier for students to understand a phenomenon, solve problems, remember and think. This is in accordance with the main concept of Team Assisted Individualization learning model which divides students into groups and then collaborates in learning. It is also completed by student worksheet based on Contextual Teaching and Learning which directs students to be able to connect and apply learning material to everyday life.

The following are the results of the analysis of the student response questionnaire :

Table 4. Data Recapitulation of Student Response Questionnaires in Learning

No	Statement	Assessment		Category
		Yes	No	
1	The learning process was interesting and fun.	97,1%	2,9%	Very Good
2	I became more motivated to take part in the learning process.	97,1%	2,9%	Very Good
3	I became more active during the learning process.	94,1%	5,9%	Very Good
4	Learning took place systematically and clearly.	100%	0%	Very Good
5	The lesson taught was quite clear and easy to understand.	91,2%	8,8%	Very Good
6	This learning was able to train my ability to do experiments.	94,1%	5,9%	Very Good
7	This learning can train my sense of responsibility for the assignment given.	97,1%	2,9%	Very Good
8	The applied learning trained collaboration with group friends.	97,1%	2,9%	Very Good
9	The applied learning can make it easier for me to learn.	97,1%	2,9%	Very Good
10	I agree if this kind of learning is implemented in SMP Negeri 32 Surabaya	97,1%	2,9%	Very Good

Student response to learning by applying Team Assisted Individualization Learning Model Assisted by Student Worksheet based on Contextual Teaching and Learning received a positive response overall. Student response can be seen from the average results of the student response questionnaires which showed that the positive response of students was 96% which belongs to the very good category. According to Nurmala (2014) stated that if students are happy with the learning, students will be enthusiastic about learning. This can improve student learning outcomes.

According to Riduwan (2015) stated that if the student's answer chooses a positive response ≥ 61%, it is assumed that all students have a positive response to the statements provided. In this study, the positive response of students reached 96%, so it can be said that students of SMP Negeri 32 Surabaya gave a positive response to learning that applied Team Assisted Individualization Learning Model Assisted by Student Worksheet Based on Contextual Teaching and Learning.

CONCLUSION AND SUGGESTION

Conclusion

Implementation of learning using Team Assisted Individualization Learning Model Assisted by Student Worksheet Based on Contextual Teaching and Learning can be carried out with very good criteria. Student learning outcomes in the form of knowledge competencies have increased based on the results of the pretest and posttest which get n-gain that belongs to the high category. Student learning outcomes in the form of skill competencies also increased from the first meetings and the third meeting to belong to the the very good category. Learning by applying Team Assisted Individualization Learning Model Assisted by Student Worksheet Based on Contextual Teaching and Learning received a positive response from students.

Suggestion

It is better if Team Assisted Individualization learning model can be applied by teachers in learning in schools in order to improve student learning outcomes. It is recommended that for further research regarding student learning outcomes, the studied competencies are not only

knowledge and skill competencies, but also attitude competencies. And research should be carried out in a wider scope so that all students are able to improve learning outcomes and apply knowledge in everyday life.

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