Application of the STAD Type Cooperative Learning Model Based on Real Experience in Improving Student Learning Outcomes in Science Learning Subjects of Movement in the Movement of Animals and Plants in Junior High Schools

Irsan*, Mohammad Jamhari & Mursito Bialangi

Pendidikan Sains Program Magister/Pascasarjana – Universitas Tadulako, Palu – Indonesia 94118
Email corresponding author: irsan071spd@gmail.com

Abstract

The research method uses the Hopkins model design which consists of 4 stages, namely planning, implementation, observation, and reflection. Data collection techniques using observation and test methods. The results showed that the percentage of student activity in cycle I was 69% (enough), increased in cycle II to 88% (very good), the percentage of teacher activity in cycle I was 72% (enough), increased in cycle II to 91% (very good). Good). Likewise with the assessment of student learning outcomes; the percentage of attitude evaluation in cycle I was 87% increased in cycle II to 90%, evaluation of the realm of knowledge in cycle I for Classical absorption (CA) 74%, and Classical Learning Mastery (KKB) 83% increased in cycle II to Classical absorption (CA) 80% and Classical Learning Mastery (PKK) 93%, the assessment of the domain of skills in cycle I was 69% increase in cycle II to 94%. Based on these results it can be concluded that the application of the STAD type cooperative learning model based on real experience can improve the learning outcomes of class VIII students in learning science on the movement of animals and plants at SMP Negeri 1 Tombusabora Sindue

Introduction

The purpose of education is a target that must be achieved in learning, so the teacher has a very important role and role. Therefore, teachers need to strive for ways of delivering learning material that can improve student learning outcomes, teachers are required to choose and implement learning strategies that are in accordance with the material to be delivered during the learning process. (Abimanyu et al., 2015).

Learning Natural Sciences (IPA) in Junior High Schools (SMP) aims to make students have a systematic curiosity about the concept of nature and events in the surrounding environment so that science is not only mastery of a collection of knowledge in the form of facts, concepts, principles only but also a process of discovery and as a product of science subjects in schools. (Aryana, 2015).

The cooperative approach is a systematic learning model by grouping students to create effective learning and integrating social skills with academic nuances (Hamdu & Agustina, 2011).

according to Haerullah (2013), defining cooperative learning type STAD means that in cooperative learning students learn together, contribute to each other's thoughts, and are responsible for the achievement of learning outcomes individually or in groups.

STAD is one of the simplest cooperative learning methods and is the best starting model for new teachers using the cooperative model. STAD tends to study groups, students in groups who are having difficulties will be assisted by other students in one group. (Megawati, 2015).

Direct experience is an experience that a person gets as a result of one's own activities. Someone is in direct contact with the object to be studied without using intermediaries. Because of this direct experience, there is a tendency for the results obtained by students to be concrete so that they will have high determination. (Husamah & Pantiwati, 2014).

According to Adiatmah (2015), he states that there are 7 steps in the learning model while in the Real experience learning model, there are 6 steps. In the first stage the steps of the STAD type learning

model are the stages of learning preparation consisting of 3, namely material preparation, placement of students in groups, and determining the basic score of these three sections are designed in such a way as to make it easier for students to understand the material, especially in student activity sheets (LKS), and to facilitate students in balanced group division based on academic ability and gender.

According to Bakar (2014), other weaknesses that may occur are that the STAD type of cooperative learning model is not the most effective medicine for solving problems that arise in small groups. The existence of addiction, causes students who are slow to think unable to practice independent learning, and also the STAD type cooperative learning model takes a long time so that the target to achieve the curriculum cannot be met, cannot apply subject matter quickly, as well as assessments of individuals and groups and giving gifts make it difficult for the teacher to do.

According to Astuti & Mustadi (2014), learning is a process in which behavior is generated or changed through practice or experience. The experience itself can be either direct experience or indirect experience.

According to Mulyadanti (2013), educational media is a set of tools or complementary tools used by teachers or educators in order to communicate with students or students. The media can represent what the teacher is unable to say, either through certain words or sentences, even the abstractness of the material can be made concrete by the presence of the media. Students will find it easier to digest the material they learn, rather than without the help of the media. But keep in mind that the role of the media will not be seen if its use is not in line with the content and objectives of the teaching that has been formulated. As we all know that what is meant by learning is the process of changing behavior through experience.

The long-term advantages that can be learned from the type of STAD cooperative learning are as follows:

1. Increase sensitivity and social solidarity.
2. Allows students to learn from each other about attitudes, skills, information, social behavior, and views.
3. Make it easy for students to make adjustments.
4. Allows the formation and development of social values and commitment.
5. Get rid of selfishness and selfishness.
6. Build friendships that can last into adulthood.
7. Various social skills needed to maintain a relationship of mutual need can be taught to be put into practice.
8. Increase mutual trust in fellow human beings.
9. Increase the ability to see problems and situations from various perspectives.
10. Increase willingness to use other people's ideas that feel better.
11. Increase the enjoyment of making friends regardless of differences in ability, gender, normal or disability, ethnicity, social class, religion, and task orientation.

The weakness of the STAD type learning model is that the STAD type cooperative learning model is not the most effective remedy for solving problems that arise in small groups. The existence of addiction causes students who are slow to think unable to practice independent learning, and also the STAD type cooperative learning model takes a long time so that the target to achieve the curriculum cannot be met, cannot apply subject matter quickly, as well as assessments of individuals and groups and giving gifts make it difficult for the teacher to do.

The conclusion that can be drawn from the description above is that to overcome the weaknesses in the implementation of the STAD type of cooperative learning model, it is better if one group member is assigned to read different parts so that they can gather and exchange information. Furthermore, the teacher evaluates all parts of the material, in this way each member feels responsible for completing his assignment in order to successfully achieve the goal.

Materials and Method

This research is a class action study. This design is done cyclically, each cycle is carried out in accordance with the changes achieved by each. the cycle consists of four stages.

A. In the first cycle

1. Planning: activities carried out is to determine the teaching materials that will be discussed in the classroom, create/design a learning implementation Plan with the subject of the motion system in animals, design the form of questions that will be used in the learning evaluation process activities both essay and multiple choice questions preparing learning facilities and infrastructure used at the time of

learning in the form of laptops, cameras, and other recording devices as well as learning media, designing teacher observation activity sheets and student observation activity sheets.

2. Action: in the implementation of learning activities in the classroom is conducted during 2 meetings. Where the first meeting the allocation of time 2 times 40 minutes as well as at the second meeting. The method used in learning is a real experience-based STAD type method, implemented in classroom 8 face-to-face or off-lane with subject teachers or researchers, observers, and students as many as 30 students.

3. Observation: the implementation of each meeting covers the subject teachers, observers, and all students of the 8-minute class where the observation is a teacher of science subjects named ASTI, S.Pd. By using the instrument of observation of teacher activity and instrument of student activity.

4. Reflection: from the reflection of the implementation of learning conducted with observers in the first cycle there are drawbacks and advantages. The lack is; Teachers have not maximized the task of students to make reports including the process of results and conclusions, teachers are less facilitating students to report the results of group work in oral form and the teacher has not fully aroused the motivation of students to argue in concluding While the advantages are: Teachers facilitate students to pay attention to learning materials by motivating students, asking students to record important things, strengthening and using learning media, teachers explaining materials with language that is easy for students to understand, clear voice intonation and repeating explanations related to important points. The results of reflection on this cycle can be used as a basis for designing learning in the next cycle.

B. In the second cycle

In this cycle, the activities carried out are basically the same as the first cycle, which is different in the subject of the subject taught. The subject taught in the second cycle is the Subject of the Motion System in Plants and the method used is also the same as in the first cycle. In the second cycle, there is also Reflection which has its drawbacks and advantages. The shortcoming is that

the teacher has not maximum stimulated students to formulate questions, has not yet maximally aroused the courage of students to conclude, the teacher has not maximum direct students to conduct interviews with classmates or with other teachers. While the advantage is that teachers facilitate students to pay attention to learning materials by motivating students, asking students to record important things, and strengthening and using learning media. The teacher explains the material in that is easy to understand for students, with clear voice intonation, skip explanations related to important points, teachers invite students to make observations, and arouse the courage of students not to be ashamed to ask people around.

This study aims to see the application of cooperative-type STAD based on Real experience that can improve students' learning outcomes about animal and plant motion. The research involves grade VIII of SMP Negeri 1 Sindue Tombusabora.

This research was conducted at SMP Negeri 1 Sindue Tombusabora in the odd semester of the 2018/2019 school year. This research sample is a grade VIII student of SMP Negeri 1 Sindue Tombusabora which numbered 30 students, 13 males, and 17 active and registered female students.

The types of data obtained in this study are qualitative data and quantitative data. Qualitative data is data obtained from students in the form of observation data of teachers and students, while quantitative data is data obtained from the test of student learning results.

Data retrieval and collection techniques conducted in this study are through observations, tests, and interviews. The subject of the study was the cooperative application of STAD-type real experience-based research instruments used in this study describing the improvement of science learning results on the subject of animal and plant motion

The technique used in analyzing data to determine the percentage of student learning completeness using the formula (Nurhidayati et al., 2015) is as follows:

1. Individual absorption

Individual absorption = (Score obtained) / (Maximum score of the test) × 100%

A class is said to have completed learning individually if the percentage of individual absorption is at least 65%.

2. Completeness of classical learning

Percentage of classical completions = (number of students who complete learning)/(number of students in total) × 100%

A class is said to have completed learning classically if at least 75% of students have completed it.

His research is classroom action research, which is reflective in nature and carried out by actors to increase rational stability and action in carrying out tasks and deepen understanding of learning conditions and practices. In the implementation of this research, it begins with the implementation of learning actions for students, after that make observations on the implementation of the action using the learning observation format that has been designed previously. Then proceed with a reflection which aims to analyze the data at the end of each action, then continue giving tests which are used to measure the ability of students both individually and classically and the last is interviews with teachers and students about what problems students face and teachers during the teaching and learning process.

Qualitative indicators of learning in this study can be seen from two aspects, namely the results of observations of student activities and the management of learning by the teacher. This research is declared successful if both aspects are in the good or very good category. To obtain data on student learning outcomes, the teacher uses an observation sheet which is analyzed in the form of a percentage which is calculated using the formula:

Percentage of mean value (NR) = (total score) / (maximum score) × 100% (Saptono, 2016).

Information:
90% ≤ NR ≤ 100%: Very good
70% ≤ NR ≤ 90%: Good
50% ≤ NR ≤ 70%: Enough
30% ≤ NR ≤ 50%: Less
0% ≤ NR ≤ 30%: Very less.

Results and Discussion

1. Cycle action one

a. Observation results of cycle one teachers

The assessment activity was carried out by involving class VIII teachers of SMP Negeri 1 Sindue Tombusabora as observers (observers) of the learning activities carried out by the teacher. Observations were made by using the teacher's activity observation sheet, scoring assessments using a vulnerability scale of 1 to 5. The results of data analysis on teacher activity observation in science learning, through the real experience-based STAD type cooperative learning model. Teacher activity in learning in cycle I obtained a score of 54 with a percentage of 72% or sufficient category, thus teacher learning activities must be improved and increased in the next cycle.

b. Observation results of cycle one students

The average value of student learning outcomes through the cooperative learning model type STAD is obtained that the percentage of classical absorption in cycle 1 is 74% with moderate criteria and the percentage of classical learning completeness in cycle I is 83% with high criteria (Table 1).

Table 1. Data analysis of student learning outcomes test cycle I

No.	Acquisition aspect	Student learning outcomes in cycle I
1	Total student	30
2	Lowest score	35
3	Highest score	90
4	Number of students who completed	22
5	Number of students who didn't complete	8
6	Classical absorption	74%
	Completeness of classical learning	83%

c. Reflection cycle 1

The implementation of learning in cycle 1 cannot be separated from its strengths and weaknesses. The advantages and disadvantages of cycle 1 are as follows:
 a. Deficiency

Teachers have not maximized student assignments to make reports that include: process, results, and conclusions, teachers do not facilitate students to report the results of their group work in oral form, teachers have not fully aroused student motivation to be able to argue in conclusions
 b. Advantages

The teacher facilitates students to pay attention to learning material by motivating students, asking students to note important things, providing reinforcement and using learning media. The teacher explains the material in language that is easy for students to understand, with clear voice intonation, and repeats explanations related to important points.

The results of the reflection are used as the basis for planning learning in cycle 2 better. The shortcomings that exist in the action cycle 2 need to be fixed and the advantages that exist in the action cycle 2 need to be maintained and increased.

2. Cycle action two

a. Observation results of cycle two teachers

The assessment activity was carried out by involving class VIII teachers of SMP Negeri 1 Sindue Tombusabora as observers (observers) of the learning activities carried out by the teacher. Observations were made by using the teacher's activity observation sheet, scoring assessments using a vulnerability scale of 1 to 5. The results of data analysis on teacher activity observation in science learning, through the real experience-based STAD type cooperative learning model. The teacher activity in learning in cycle II obtained a score of 54 with a percentage of 72% or very good category, thus teacher learning activities must be maintained in order to improve learning outcomes and student learning activities.

b. Observation results of cycle two students

The results of the observation of student activities in cycle two in general, student activities

in learning in cycle II obtained an average percentage of 88% or very good category, in cycle II student activity experienced a significant increase.

3. Student learning outcomes cycle two

a. Attitude realm assessment

Analysis of student learning outcomes or skills assessed in this study is the realm of attitudes, knowledge, and attitudes. the results of the analysis of the assessment of discipline, honesty, responsibility, and courtesy with a percentage in cycle I 87% very good category as well as in cycle two with a percentage of 90% very good category.

b. Cognitive domain assessment

The test of individual student learning outcomes in science learning through the role of the STAD type cooperative learning model in the subject of motion in plants that occurs in everyday life. Giving evaluation tests in the form of multiple choice (PG) and essays were given individually. The results of the data analysis of the evaluation test of student learning outcomes show that the average value of student learning outcomes through the cooperative learning model type STAD is obtained that the percentage of classical absorption in cycle 1 is 74%, an increase in cycle II 80% is an increase of 6% with moderate criteria. The percentage of classical learning completeness in the first cycle was 83% increased in the second cycle to 93% an increase of 10% with high criteria.

Table 2. Data analysis of student learning outcomes test cycle II

No.	Acquisition aspect	Student learning outcomes in cycle II
1	Total student	30
2	Lowest score	60
3	Highest score	95
4	Number of students who completed	28
5	Number of students who didn't complete	2
6	Classical absorption	80%
	Completeness of classical learning	93%

c. Skill realm assessment

Table 3. Skill domain assessment analysis results

No	Shutter skills	Average score	
		Cycle I	Cycle II
1.	Discussions in accordance with the producer	2.5	4
2.	Cooperation	2.5	3.5
3.	Record the results of the discussion	3	3.5
4	Percentage of discussion results	3	4
5.	Percentage	69%	94%
	Category	Enough	Excellent

The results of the assessment in the realm of skills have the results of the analysis of the realm of skills assessment; Do the discussion correctly, cooperate, record the results of the discussion, and present the results of the discussion with a percentage in the first cycle 69% sufficient category, increased in the second cycle with a percentage of 94% very good category.

4. Reflection Cycle two

The implementation of learning in cycle II cannot be separated from its strengths and weaknesses. The advantages and disadvantages of cycle II are as follows:

a. Deficiency

Teachers have not maximally stimulated students 'abilities to formulate questions, have not maximally aroused students' courage to ask questions, teachers have not maximally facilitated students in conducting experiments, and teachers have not maximally directed students to carry out interviews with community leaders.

b. Advantages

The teacher facilitates students to pay attention to learning material by motivating students, asking students to note important things, providing reinforcement, and using learning media. The teacher explains the material in language that is easy for students to understand, with clear voice intonation, repeats explanations related to important points, the teacher invites students to make observations in the environment, and arouses students' courage not to be embarrassed to ask people around.

The implementation of this research went well and had good results too, because it was supported by several factors, namely as seen in cycle 1 and cycle II there was an increase. Researchers work with class teachers, who provide opportunities for researchers to make observations in class VIII about how to increase student activity and student learning outcomes at SMP Negeri 1 Sindue

Tombusabora, on motion material in animals and plants.

5. *Analysis of student activity in cycles one and two*

The STAD type of cooperative learning model in science learning is a learning model that is quite effective in using especially in the material of motion in of animals and plants, because overall the observation of student and teacher activities in the teaching and learning process can be seen from an increase from cycle I to cycle II. According to Haloho (2014) that the STAD type cooperative learning model is a learning approach that emphasizes the learning process, activities, and creativity of students in obtaining knowledge, skills, values, and attitudes, and applying them in everyday life.

The results of the cycle analysis on student activity from 15 aspects observed in the first cycle the average percentage of student activity obtained was 69% with a sufficient category then experienced a significant increase in the second cycle with an average percentage of the gain was 88%, the category is very good because there is a very significant increase. According to Suana (2016) that learning with the STAD cooperative learning model is designed with several stages that can increase student activity and learning outcomes. Majoka et al. (2013) explain that in essence, the STAD type of cooperative learning model aims to develop student creativity in learning, students can actively develop and apply their abilities skillfully. According to Van (2012) that the use of the right model will determine the effectiveness and efficiency of a learning process.

Based on the results of observations made in two cycles through the role of the cooperative learning model type STAD, it turns out that it can increase student activity in learning is an interaction process to obtain basic knowledge, from the observation cycle I and cycle II shows an increase in student activity, teachers and learning outcomes,

achievement of performance indicators, students feel happy and motivated when participating in science learning, on the material movement in of animal and plants in class VIII SMP Negeri 1 Sindue Tombusabora.

6. *Analysis of the improvement of learning outcomes in cycle one and cycle two*

This shows that by using the cooperative learning model type STAD, the achievement of learning objectives and student learning outcomes have met predetermined performance indicators. Based on classroom action research carried out in class VIII SMP Negeri 1 Sindue Tombusabora on motion material in animals and plants, an increase in the percentage of classical learning completeness from the results of learning analysis from cycle one to cycle two was obtained. The results of the final analysis on the average learning outcomes of students in the first cycle of action showed that of the 30 students who attended the first cycle of learning there were 22 students who completed with a classical learning completeness percentage of 83% while classical absorption reached 74%, then an increase occurred. which is significant in cycle two with completeness reaching 28 people or a percentage of CBC by 93% and classical absorption reaching 80%.

Based on the results of the research shown above, it is found that applying the STAD type cooperative learning model to the motion material in animals and plants is an alternative to increasing the activity and learning outcomes of students in class VIII SMP Negeri 1 Sindue Tombusabora. By using the STAD type of cooperative learning model, students have a very large opportunity to develop their potential both academically and in terms of self-potential skills or individual potential of each student.

Science learning has many new things or materials that are considered to be of interest to students because it is in accordance with everyday life, such as movement material in plants. (Widyaningrum, 2016), student learning outcomes have met the requirements of quality learning tools, namely valid, practical, and effective in increasing student and teacher activities due to improvements based on the weaknesses that exist in cycle 1 and then corrected in cycle II. Increased student activity and teacher activity in science lessons, this is due to the role of the STAD type cooperative learning model being actively followed by students during

the learning process (Setiogohadi, 2017). Applying the STAD type of cooperative learning model, it can increase student activity and learning outcomes on motion material in animals and plants so that students can obtain evidence of the truth of the theory according to what students learn, motivating them to display new ideas in lessons.

Learning videos are the most appropriate media to use in the learning process because students are easier to visualize the material being taught especially those related to internal organs, by using the STAD type cooperative learning model, this learning can be proven from the results of student and teacher activities. This indicates that there is an increase in learning outcomes in class VIII SMP Negeri 1 Sindue Tombusabora which can be seen in cycle I and cycle II that have fulfilled the criteria obtained in the performance indicators. Students feel happy studying science material because of direct practice both at school and at the class teacher's house, by utilizing existing media, with direct practice students and teachers can prove the truth that exists from the theory being learned. Besides being beneficial for students and also beneficial for teachers to be able to improve teacher competence in developing student skills to work together.

Improved learning outcomes and student activities are closely related to the STAD cooperative learning model. Because the STAD type of cooperative learning model is a student-centered approach, the teacher is only a facilitator in the learning process, students are given the freedom to build their own conceptual material taught through observation and data collection. According to Tiantong et al. (2013) To respond and solve problems actively to natural phenomena that occur around them, students must be actively involved and motivated in participating in learning. In addition, learning with the STAD type cooperative model needs to be improved. Increased learning activities will make student learning outcomes better. Efforts to overcome this problem are improvements to learning activities, where learning can apply appropriate and innovative learning models.

The causes of high, medium, and low increases were due to the fact that during the learning process, there were students who were very enthusiastic but some were not enthusiastic. So that the teacher reflects as material for improvement at

the next meeting, after reflection and improvement there is a high increase in student learning outcomes and student learning activities using the STAD type cooperative learning model. According to Van (2013) that one of the learning approaches that can be applied to increase student activity and cognitive learning outcomes is the STAD type cooperative learning model. STAD type cooperative learning model is a learning approach that gives students the opportunity to find facts and build concepts, through activities and/or experiences.

Based on the description above, the use of STAD type cooperative learning model on motion material in plants can motivate students to be more active, creative, and nimble and understand learning material faster and can show that student learning outcomes increase (Wang & Tzu-Pu, 2009)

Conclusions

Based on the research conducted, it can be concluded that the application of cooperative learning outcomes of the STAD type based on real experience can improve student learning outcomes in class VIII science learning on the subject of animal and plant movement at SMP Negeri 1 Sindue Tombusabora. The activities of teachers and students in implementing cooperative STAD-type based on real experience can improve student learning outcomes in class VIII in science learning on the subject of animal and plant movement.

Acknowledgments

References

Abimanyu, W.A., Bakri, M., & Ibnu, H. (2015). Penerapan model kooperatif tipe STAD untuk meningkatkan hasil belajar siswa pada materi luas permukaan dan volume limas di kelas VIII SMP Negeri 5 Palu. *Jurnal Pendidikan Matematika, 4*(2). 154-157.

Adiatmah, V. A., Iswari, R. S., & Peniati, E. (2015). Pengaruh model pembelajaran stad menggunakan lembar kerja siswa berbasis materi guided discovery animalia terhadap hasil belajar. *Jurnal Pendidikan Biologi Unnes, 4*(3), 269-274.

Aryana, I. G. M. R., Idrus, A. A., & Harjono, A. (2015). Pengaruh model pembelajaran kooperatif NHT dan STAD terhadap hasil belajar siswa SMA Negeri 2 Gerung. *Jurnal Pijar MIPA, 10*(2), 49-56.

Astuti, Y. W., & Mustadi, A. (2014). Pengaruh penggunaan media film animasi terhadap keterampilan menulis narasi siswa kelas V sekolah dasar. *Jurnal Prima Educasia, 2*(2), 102-115.

Bakar, R. (2014). The effect of learning motivation on students' productive competencies in vocational high school, West Sumatra. *International Journal of Asian Social Science, 4*(6), 722–732.

Haerullah, A. (2013). Penerapan model pembelajaran kooperatif STAD untuk meningkatkan aktivitas dan hasil belajar biologi siswa kelas VII MTS Negeri Kota Ternate. *Jurnal Bionature, 14*(2), 105-111.

Haloho, L. (2014). Peningkatan aktivitas pembelajaran biologi siswa melalui penerapan model pembelajaran kooperatif tipe STAD (Student teams achievement division) pada siswa kelas X-3 SMA Negeri 2 Medan. *Jurnal Saintech, 6(*2), 18-25.

Hamdu, G. & Agustina, L. (2011). Pengaruh motivasi siswa terhadap prestasi belajar IPA di sekolah dasar (Studi kasus siswa kelas IV SDN Tarumanagara Kecamatan Tawang Kota Tasikmalaya). *Jurnal Penelitian Pendidikan, 12*(1), 81-86.

Husamah, & Pantiwati, Y. (2014). Cooperative learning STAD - PPA: motivation, thinking skills, and learning outcomes of biology department students. International *Journal of Education Learning and Development, 2*(1), 68–85.

Majoka, M. I., Dad, M. H. & Mahmood, T. (2010). Student team achievement division (STAD) as an active learning strategy: empirical evidence from mathematics classroom. *Journal of Education and Sociology*, 16-21.

Megawati, Tri, D. A., Wiarta, I. W. & Manuaba, S. (2015). Penerapan pendekatan saintifik dengan penilaian proyek untuk meningkatkan kemampuan penalaran dan hasil belajar pengetahuan matematika. *MIMBAR PGSD Undiksha, 1*(3), 6-11.

Mulyadanti, N. D. (2013). Pembelajaran biologi model STAD dan TGT ditinjau dari rasa ingin tahu dan minat belajar siswa. *Jurnal Pendidikan Sains Indonesia Unnes, 2*(1), 12-17.

Nurhidayati, S., Zubaidah, S., & Indrawati, E. I. (2015). Pengaruh metode STAD yang dikombinasikan dengan Guided Inquiry terhadap hasil dan aktivitas belajar biologi siswa. *Jurnal Kependidikan, 14*(1), 73-81.

Saptono. (2016). Respon siswa terhadap pembelajaran realistik menggunakan media Geogebraik materi lingkaran siswa kelas VIIIA SMP Negeri 2 Sugio. *Jurnal AdMathEdu, 6*(1), 67-73.

Setiogohadi. (2014). Penerapan model pembelajaran kooperatif tipe STAD untuk meningkatkan aktivitas dan hasil belajar IPA siswa kelas VII.2 SMP Negeri 24 Palembang. *Jurnal Inovasi dan Pembelajaran Fisika, 1*(1), 12-21.

Tiantong, Monchai, & Sanit, T. (2013). Student team achievement division (STAD) technique through the moodle to enhance learning achievement. *International Education Studies,* 6(4), 91.

Wang, & Tzu. P. (2009). Applying Slavin's cooperative learning techniques to a college EFL conversation class. *The Journal of Human Resource and Adult Learning, 5*(1), 112-120.

Widyaningrum, D. A. (2016). Penerapan model pembelajaran berbasis proyek untuk meningkatkan aktivitas belajar siswa pada mata kuliah pengembangan bahan ajar. *Saintifika, 18*(1), 1-7.

Van, D. T. (2013). Effects of student teams' achievement division (STAD) on academic achievement, and attitudes of grade 9th secondary school students towards mathematics. *International Journal of Sciences*, *2*(04), 5-15.

Van, W. M. (2012). The Effects of the STAD-cooperative learning method on student achievement, attitude, and motivation in economics education. *Journal of Social Science, 33*(2), 261–270.

.