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Application of the STAD Type Cooperative Learning Model with the SETS Approach to Student Learning Outcomes at Arosbaya Middle School

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ABSTRACT

This research aims to describe the implementation of the STAD type cooperative learning model with the SETS approach, student learning outcomes, and student responses after participating in the teaching and learning process. This type of research is pre-experimental, using one class as the research target, namely class VIII-i with 34 students. The research design used is a one shot case study design. The research was carried out over three meetings, with two meetings for the teaching and learning process, and one meeting for tests on students' cognitive and psychomotor learning outcomes. The observation results show that the implementation of the STAD type cooperative learning model with the SETS approach on household chemicals material has been managed according to syntax in the very good category (89%). The learning outcomes for the cognitive aspect have successfully completed 30 students (88.2%), while 4 students (11.8%) did not complete it. Based on the results of the normality test, it was found that the class had a normal distribution with $\chi count < \chi table$ (9.5<11.07) with $\alpha=0.05$. Based on the one-party t test, it was found that tcount > ttable ($\alpha=0.05$), with tcount of 4.96 and ttable of 1.70. This shows that the application of the STAD type cooperative model with the SETS approach to household chemicals material can improve student learning outcomes. Students' performance skills observed through the psychomotor aspect showed the very good category (90.8%) and the affective aspect showed the good category (84.5%). Based on the results of the questionnaire, it is known that students responded positively to the learning that took place with very good criteria (95.3%).

Keywords:STAD type cooperative learning with the SETS approach, student learning outcomes, household chemicals

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ABSTRACT

This study aims to describe the students' learning achievement, the implementation of cooperative learning of STAD using SETS approach, and the students' respond after following the teaching and learning process. This is a pre-experimental study, and the researcher chose one class as the subject of the research, that is, class VIII-i consist of 34 students. The design of the study is *one shot case* design. The study was conducted for three meetings, two meetings for the teaching and learning process, and one meeting for the administration of cognitive and psychomotor test. The findings of the study shows that the implementation of cooperative learning of STAD using SETS approach in the material of household chemicals have been implemented well based on the syntax in the category of very good (89%). The cognitive aspect of the learning achievement of the successful students were 30 students (88,2%), unsuccessful students were 4 (11,8%). The result of normality test shows that it is normally distributed classes with $\chi_{score} < x_{table}$ (9,5 <11,07) with $\alpha = 0,05$. The result of t-test of one-tailed obtained $t_{score} > t_{table}$ ($\alpha = 0,05$), with t_{score} of 4,96 and 1,70 for t_{table}. This result shows that the implementation of cooperative learning of STAD using SETS approach in the material of household chemicals improves the students' learning achievement. The students' performance in the psychomotor aspect is the category of excellent (90,8%), and the affective aspect is in the category of good (84,5%). Based on the results of questionnaires known that students respond positively to the teaching and learning process with the criteria of very good (95,3%).

Keywords: *Cooperative Learning, STAD, SETS Approach, Students' Learning Achievement, Household Chemicals.*

A. INTRODUCTION

SMPN 1 Arosbaya is located near rice fields and river basins. Apart from that, the characteristic of the surrounding community which is consumptive and tends to throw away household waste carelessly means that students need to be taught a technology to minimize pollution caused by household chemicals by utilizing surrounding

materials. Household chemicals are closely related to elements of the environment, technology and society. Therefore, this material is very suitable if applied using the Science, Environment, Technology and Society (SETS) approach. The SETS approach is a way of learning by linking things learned with aspects of science, the environment,

technology and society are mutually compatible as a form of integrated interrelationship (Binadja, 2008).

In the household chemicals material, several Basic Competencies (KD) are combined in a connected way. In this material there is integration between the two scopes of the field of study. The material on household chemicals and the separation of mixtures is included in the field of chemical studies, while the material on environmental management is included in the field of biological studies. Even though these two concepts are different fields of study, they are still within the same field of study, namely natural sciences. The material on household chemicals, separation of mixtures and environmental management is combined because the material is still related. Household chemicals can cause environmental damage, so society must play a role in managing the environment.

Based on interviews conducted with class VIII science subject teachers at SMP Negeri 1 Arosbaya, in the science teaching and learning process, teachers more often only present lecture methods and rarely hold practical activities in class, so that students' psychomotor intelligence is not explored well. This is reinforced by the results of the questionnaire which states that 100% of teachers often use the lecture method in the learning process. The lecture method is usually taught on factual material without practicing skills and with the aim of increasing students' knowledge (Muhibbin: 2008). Using this lecture method causes students who have high psychomotor intelligence to not be able to follow lessons well and the class tends to be passive so that 35% of student learning outcomes are below the Minimum Completeness Criteria (KKM) set by the school, namely 75.

Therefore, we need a learning model that actively involves students so that it can enliven the learning atmosphere in the classroom and the learning outcomes will be higher. One learning model related to the above is cooperative learning. The cooperative learning model is a learning model developed to achieve academic learning outcomes and also to develop students' social skills. One type of cooperative learning is Student Team Achievement Divisions (STAD). The reason for choosing the STAD type cooperative learning model is because there are group awards which can increase student participation in class. In the learning process, each group is motivated to compete actively so they can get awards. Apart from that, students are required to establish good collaborative relationships so that they can improve their learning outcomes. In the Household Chemicals material, there are several practical activities that emphasize group collaboration so that STAD type cooperative learning can help

students to develop problem-solving skills through cooperation and critical thinking, especially in scientific concepts and their relationship to the fields of environment, technology and society. Students can

easily understand the material because there are experimental activities that can improve students' scientific skills and can apply them in everyday life.

The results of research conducted by Fatimatuzzahro (2011) stated that STAD type cooperative learning with the Science, Environment, Technology and Social (SETS) approach on the subject of Characteristics of Chemical Reactions has succeeded in completing learning outcomes for the cognitive domain, namely 72.2% in the post tests 1 and 100
% in post test 2, while learning completion in the affective and psychomotor domains has increased, namely from 66.7% to 92% for the affective domain and 72.2
% to 94% for the psychomotor domain. Another research conducted by Rohmatus Syafi'ah Research (2012) stated that the application of STAD type cooperative learning with the theme of global warming in class VII SMP students had succeeded in increasing learning completeness with an average of 77.4. These two studies show that the application of STAD type cooperative learning with the SETS approach can improve student learning outcomes.

From the description above, the researcher took the title "Application of the STAD Type Cooperative Learning Model with the SETS Approach to Student Learning Outcomes on Household Chemical Materials at SMP Negeri 1 Arosbaya".

B. Problem Formulation

From the background above, the researcher formulated the problem formulation as follows: "Can the application of STAD type cooperative learning with the SETS approach improve student learning outcomes in household chemicals at SMPN 1 Arosbaya?"

The research questions from the problem formulation above are:

1. How is STAD type cooperative learning implemented with the SETS approach on household chemicals?
2. What are the student learning outcomes after carrying out the STAD type cooperative learning process with the SETS approach on household chemicals?
3. How do students respond to teaching and learning activities using the STAD type cooperative learning model with the SETS approach on household chemicals?

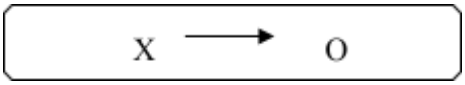
C. RESEARCH METHODS

This type of research is*pra experimental*where researchers use one class as a research

subject. This research was carried out at SMP Negeri 1 Arosbaya. The subjects of this research were students in class VIII-i of SMP Negeri 1 Arosbaya. The number of students in class VIII-i is 34 people. Class VIII-i was chosen because the students' abilities were almost evenly distributed based on the results of interviews with science teachers.

This research uses a design*one-shot case study*. In this design, a class is given treatment and the results are observed. The design is as follows:

(Sugiyono, 2008: 74)



Information:

X: Application of the STAD type cooperative learning model with the SETS approach O: observation of learning outcomes after applying the model
STAD type cooperative learning with the SETS approach

The procedure in this research consists of two stages, namely the preparation stage and the implementation stage.

In the Preparation Stage, the following procedures are carried out:

a. Carrying out initial observations, namely carrying out interviews with the class VIII science teacher at SMP Negeri 1 Arosbaya and giving questionnaires to students.
b. Choose the learning model that will be applied, namely the STAD type cooperative learning model using the SETS approach.
c. Prepare learning tools including: Syllabus, Learning Implementation Plan, Student Books, Student Activity Sheets, and Evaluation Questions.
d. Create research instruments, including learning outcomes test sheets, assessment sheets for psychomotor and affective aspects, implementation sheets for the STAD type cooperative learning model with the SETS approach, and questionnaire sheet.
e. Validating learning tools for two lecturers in the field of science and a science teacher.

At the Implementation Stage, the following procedures are performed:

a. Carrying out the teaching and learning process. This research was carried out over three meetings, with a time allocation of 2x40 minutes/meeting. The first and second meetings are used for teaching and learning activities and the third meeting is used for cognitive and psychomotor aspect tests. At this stage learning activities are carried out using the STAD Type Cooperative Learning Model with the SETS approach. The next stage is to observe the implementation of learning. At the end of the meeting, the teacher gives a test to measure student learning outcomes.
b. Perform data analysis.
c. Reporting research results. At this stage the researcher writes a research report

after analyzing all the data that has been obtained in consultation with the supervisor.

The instruments used in this research are:

*Learning results test sheet.*Student learning outcomes after receiving teaching using the STAD type cooperative model with the SETS approach, measured with an instrument in the form of a set of test questions. The questions given to students are 10 multiple choice questions and 4 essay questions. Before being used as an instrument, the questions were content validated by experts, namely two science lecturers and one science teacher, then tested to determine the reliability of the test. The validation results show that the questions are suitable for use with revision.

To find the reliability of multiple choice questions, the Spearman-Brown formula is used with the odd-even split technique, namely:

$$r_{11} = \frac{2r_{1/2\ 1/2}}{r_{1/2\ 1/2}}$$

(Arikunto: 2009)

Information:

r_{11} = internal reliability of all instruments

$r_{1/2\ 1/2}$ = r_{xy} = correlation*product moment*

To determine the reliability of the description questions, the alpha formula is used, namely:

$$r_{11} = \left(\frac{n}{(n-1)}\right)\left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2}\right)$$

(Arikunto: 2009)

Information :

n = number of questions

$\sum\sigma^2_i$ = total variance in scores for each item

σ^2_t = varians total

Table 3. Test reliability categories

Reliability coefficient	Interpretation
0,80 ≤ r ≤ 1,00	very high reliability
0,60 ≤ r <0,80	high reliability
0,40 ≤ r < 0,60	moderate reliability

0,20 ≤ r < 0,40	low reliability
-1,00 ≤ r < 0,20	unreliable

(Guilford in Hidayat: 2008)

From the results of calculations based on test results distributed to class VIII-h as many as

33 people, obtained a reliability coefficient for the multiple choice test of 0.53 which shows the questions have moderate reliability, and for the description questions obtained a reliability coefficient of 0.49 which is included in the medium category.

*Psychomotor and affective assessment sheet.*This assessment sheet aims to provide an assessment to students regarding their psychomotor and affective abilities. Form

The assessment on this assessment sheet is in the form of a score. This assessment sheet was previously validated on one science lecturer and teacher. Suggestions from the validator are then used as a reference for revision so that the results are suitable for use as an instrument.

*Learning Implementation Observation Sheet.*This instrument aims to measure the implementation of the STAD type cooperative learning model through the SETS approach carried out by the teacher. This observation sheet consists of several observed aspects, namely learning syntax (opening, core and closing activities), time management and class atmosphere. The learning implementation observation sheet was reviewed by experts, namely one lecturer and a science teacher. Suggestions from experts are then used as a reference for revision so that the results are suitable for use as an instrument.

*Questionnaire.*The questionnaire was used to determine students' responses after participating in teaching and learning activities by implementing Integrated Science learning with the STAD type cooperative model with the SETS approach to household chemicals. The questionnaire sheet was validated by two experts, namely a lecturer and a science teacher. Suggestions from experts are then used as a reference for revision so that the results are suitable for use as research instruments.

Data collection techniques are obtained in the following way:

1. Carrying out the teaching and learning process by applying the STAD type cooperative model with the SETS approach during two meetings. The first meeting with the sub-material types and groupings of household chemicals, as well as the uses of household chemicals. The second meeting with the sub-material of side effects of household chemicals and how to prevent them. Researchers took students' UAS science scores as a reference for group division.
2. Give observation sheets to two observers, namely one science teacher and one student from the Science Education department.
3. Make direct observations during the learning process. Observations are carried out at every meeting. The observation sheets provided include learning implementation observation sheets and affective assessment observation sheets.
4. Give tests to students at the third meeting to determine students' understanding and skills regarding Household Chemicals material. The tests given are cognitive tests and psychomotor skills tests.
5. Give questionnaires to students at the end of the third meeting. The questionnaire used is a closed questionnaire with yes and no criteria so that students can choose

one answer by giving marks*checklist* (√).

Data analysis techniques are carried out through learning management analysis, analysis of learning outcomes tests, and student responses to the teaching and learning process.

*Learning management analysis.*Learning management data is analyzed by calculating the average for each aspect of the number of meetings that have been held.
Then the scores are converted by category:

0% - 20% = less at all
21% - 40% = less
41% - 60% = enough
61% - 80% = good
81% - 10% = very good
(Riduwan: 2010)

Management is said to be effective if the teacher's ability reaches the good or very good category.

*Analysis of learning outcomes tests.*Data analysis of learning outcomes tests is carried out by calculating quiz results, cognitive learning outcomes, and psychomotor and affective learning outcomes.

Analysis of the first learning outcomes test using a quiz. Quizzes are used to determine individual and group development scores.

$$\text{Group score} = \frac{\Sigma \text{ individual contributions from group members}}{\text{Members of the group}}$$

The team award level scores are categorized as follows:

15-19 = Good team (good team)
20-24 = Great team
25-30 = Super team (tim super)
(Nur, 2011: 36)

The second learning outcomes test analysis uses Cognitive Learning Outcomes. To determine students' mastery in learning, by using calculations:

$$\text{Student scores} = \frac{\text{The score obtained}}{\text{Maximum score}} \times 100$$

Individually, students are said to have completed their studies if they get a score of ≥75, while the class is considered to have completed their learning if there are ≥ 85% of

students who have completed (Ministry of National Education in Mulyasa, 2007: 254).

Before data analysis, a normality test was carried out using chi square (χ^2). If the calculation results show $\chi^2_{count} < h^2_{table}$ with $\alpha=0.05$, this indicates that the sample is normally distributed. The normality test formula is as follows:

$$h^2_h = \frac{(f_0 - f_h)^2}{f_h}$$ (Sugiyono: 2008)

Information:

h^2 : chi squared

f_h : frequency of expectations

f_O : data frequency

To analyze cognitive learning outcomes, with the formula:

$$t = \frac{\bar{x} - m_0}{s/\sqrt{n}}$$

(Sudjana: 2005; Sugiyono: 2008)

information:

$\bar{x}$: mean of cognitive learning outcomes

m_0 : KKM limit (75)

s : standard deviation

n : number of samples

If $t_{count} > t_{table}$, eye H_a accepted.

Analysis of the third learning outcomes test using psychomotor and affective learning outcomes. Student performance scoring is every ability that is observed and assessed on a score scale of 1 to 4 with a score description as attached in the assessment rubric.

Psychomotor learning outcomes

Psychomotor learning outcomes are obtained using the formula:

$$\text{Student scores} = \frac{\text{The score obtained}}{\text{Maximum score}} \times 100\%$$

Affective learning outcomes

Affective learning outcomes are obtained using the formula:

$$\text{Student scores} = \frac{\text{The score obtained}}{\text{Maximum score}} \times 100\%$$

Next, student scores are converted using the following criteria:

0% - 54% = very poor
55% - 64% = less
65% - 79% = enough
80% - 89% = good
90% - 100% = excellent

(Purwanto: 2008)

*Student responses to the teaching and learning process.*To find out the percentage of student responses, the following formula is used:

$$\% \text{ student responses} = \frac{\sum \text{students answer yes/no}}{\sum \text{whole student}} \text{ X } 100\%$$

Furthermore, the student response criteria are as follows:
0% - 20% = less at all

21% - 40% = less
41% - 60% = enough
61% - 80% = good
81% - 10% = very good
(Riduwan: 2010)

D. RESEARCH RESULT

Learning Implementation Analysis

Observations on the implementation of the STAD type cooperative learning model using the SETS approach were carried out using the learning implementation observation sheet instrument which was observed by two observers, namely a science student and a science teacher. The following table presents the results of observations of learning implementation.

Table 4.1. Observation results of the implementation of STAD type Cooperative learning using the SETS approach

No	Rated aspect	The observer	Score meeting to		The average score of along with	Shoes total	Percentage
			1	2			
1	**a. Introduction**						
	1) Convey learning objectives	1	3	4	3,5	3,75	94%
		2	4	4	4		
	2) Giving motivation to students	1	4	4	4	3,75	94%
		2	3	4	3,5		
	Aspect average		3,5	4		3,75	**94%**
	b. Core activities						
	1) The teacher informs about STAD type cooperative learning	1	4	-	4	4	100%
		2	4	-	4		
	2) The teacher gives students books	1	4	4	4	3,75	94%
		2	3	4	3,5		
	3) The teacher conveys information	1	4	4	4	3,75	94%
		2	4	3	3,5		
	4) The teacher divides students into groups	1	3	4	3,5	3,5	88%

	each consisting of 5-6 people	2	3	4	3,5		
	5) The teacher provides worksheets and SETS connection sheets	1	3	4	3,5	3,5	88%
		2	3	4	3,5		
	6) Students are given the opportunity to discuss the contents of the LKS	1	3	3	3	3,25	81%
		2	4	3	3,5		

No	Rated aspect	The observer	Score meeting to		The average score of along with	Shoes total	Percentage
			1	2			
	7) Students carry out experiments according to the LKS	1	4	4	4	3,75	94%
		2	4	3	3,5		
	8) The teacher supervises each group in turn and provides assistance if students experience difficulties	1	4	3	3,5	3,25	81%
		2	3	3	3		
	9) The teacher asks one of the groups present practical results	1	4	4	4	3,75	94%
		2	3	4	3,5		
	10) The teacher responds to the group presentation and gives feedback.	1	3	3	3	3,25	81%
		2	4	3	3,5		
	11) The teacher discusses and evaluates the connection sheet SETS with students.	1	-	4	4	3,5	88%
		2	-	3	3		
	Aspect average		3,55	3,55		3,3	**89%**
	c. Closing						
	1) The teacher and students conclude today's learning.	1	3	4	3,5	3,75	94%
		2	4	4	4		
	2) The teacher gives a quiz to students	1	4	4	4	3,75	94%
		2	3	4	3,5		
	3) Teacher gives appreciation to best group	1	3	4	3,5	3,75	94%
		2	4	4	4		
	4) The teacher gives homework in the form of a SETS connection sheet	1	4	-	4	3,5	88%
		2	3	-	3		

	Aspect average		3,5	4		3,7	92%
II	**Time Management**Timely learning management	1	3	4	3,5	3,5	88%
		2	3	4	3,5		
	Aspect average		3	4		3,5	88%
III	**Class situation**						
	1. Student-centered	1	3	3	3	3,5	88%

No	Rated aspect	The observer	Score meeting to		The average score of along with	Shoes total	Percentage
			1	2			
		2	4	4	4		
	2. Students are enthusiastic	1	3	4	3,5	3,25	81%
		2	3	3	3		
	3. Teachers are enthusiastic	1	3	4	3,5	3,25	81%
		2	3	3	3		
	Aspect average		3,2	3,5		3,25	**83%**
Average overall aspect							**89%**

Based on table 4.1, it can be seen that the percentage obtained for preliminary activities was 94%, core activities were 89%, closing activities were 92%, time management was 88% and class atmosphere was 83%. The lowest percentage was the classroom atmosphere in class because there was a slight feeling of awkwardness at the first meeting. The highest percentage is in the introductory aspect, because the teacher has prepared carefully in providing motivation so that students are interested in following lessons in class. In general, the implementation score at the second meeting was higher than at the first meeting. The overall average percentage obtained was 89%, which is in the very good category.

Analysis of Learning Results

a) Quiz

Quizzes are given at the end of each lesson at each meeting. Quizzes are taken by each student with the aim of measuring student understanding of each lesson. The quiz results are used as student development scores and contributed to group scores. The overall quiz calculation results can be seen in attachment 25. The following are the quiz results obtained by class VIII-i students.

Table 4.2. Class VIII-i quiz results

Group	Meeting 1	Meeting 2	Progression Score	Team Category
1	26,0	26,0	26,0	Super
2	18,0	28,0	23,0	Great

3	24,0	30,0	27,0	Super
4	24,0	30,0	27,0	Super
5	16,0	30,0	23,0	Great
6	24,0	30,0	27,0	Super
7	20,0	27,5	23,8	Great
Rate-rate	21,7	28,8	25,2	

The basic score used as a reference in the quiz is the student's UAS score on science material in the odd semester. Students' basic quiz scores vary from the lowest score, namely 34, to the highest, 91. This basic score is used to determine the student's development score and then contributed to the group score. Of the 7 groups that were divided, 4 groups received super team awards and 3 groups received great team awards. The groups that received the super team award were groups 1, 3, 4 and 6, while the group that received the award
great groups are groups 2, 5 and 7.

b) Cognitive Learning Outcomes

Cognitive learning outcomes are obtained from the results of tests carried out at the end of the lesson to determine and measure students' understanding of the household chemicals material that has been taught during two meetings.
The number of students who completed was 30 students while those who did not complete were 4 students, so that students' classical completion was 88.2% and the average student score was 81.0. This shows that learning is said to be complete because it has reached ≥85% of the total number of students. Complete cognitive learning results are in appendix 26.

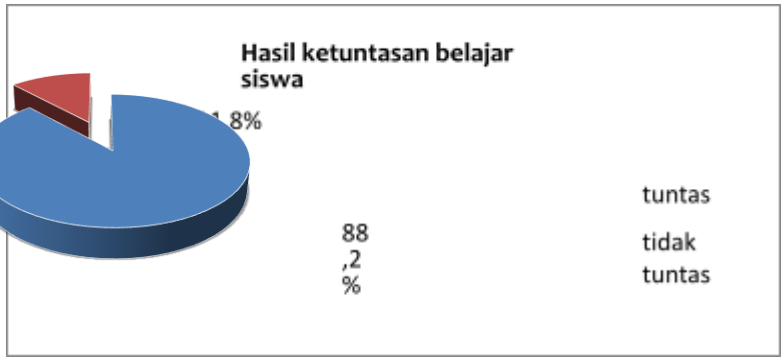


Figure 4.1 Results of student learning completion

In Figure 4.2 it can be seen that classical completeness reached 88.2%. There are 4 students who have not yet completed and get a score ≤75, namely with a score of 61, 68, 69 and
70. One of the factors in students' incompleteness in general is because students do not understand the concepts related to their incorrect answers on certain questions. Students' incompleteness can be assessed from the completion of each indicator in

learning. An indicator is declared complete if 75% of students answer the indicator correctly. The incomplete indicators are numbers 2 and 9. The results of the recapitulation of the completion of each indicator can be seen in Appendix 27. Below are the results of the indicator completion in Table 4.2.

Table 4.3. Completeness of each question indicator

No	Indicator	Question No	shoes total	% completion of questions	% completion indicator
1	Explain chemicals that can be used in everyday life	1	33	97%	87%
		3	26	76%	
2	Analyze impact use of chemical products on the environment	2	23	68%	62%
		6	19	56%	
		7	24	71%	
		9	18	53%	
3	Explain impact use of chemical products on the environment	4	32	94%	94%
4	Explain the difference between soap and detergent	5	31	91%	91%
5	Explain effort prevention of negative impacts of usage household materials	8	32	94%	94%
6	Explain the principle of separating mixtures in the water purification process using Moringa seeds	10	29	85%	85%
7	Identify the problem formulation	1	89	87%	87%
8	Analyze experimental data	2	94	92%	92%
9	Summing up the results of the experiment	3	72	71%	71%
10	Analyzing the relationship between SETS in soap technology	4	90	88%	88%

After obtaining cognitive learning results, the next step is to carry out a data normality test. From the calculation results, χ is obtained$_{count}$< h_{table} (9.5<11.07) with α=0.05, this indicates that the sample has a normal distribution. The normality test calculation can be seen in appendix 28. Because the sample is normally distributed, data analysis was carried out using a one-party average test which aims to determine the effectiveness of implementing STAD type cooperative learning with the SETS approach to improve the

completeness of student learning outcomes in household chemicals. The calculation of the average test for one party can be seen in attachment 29, while the analysis results of this calculation can be seen in the following table:

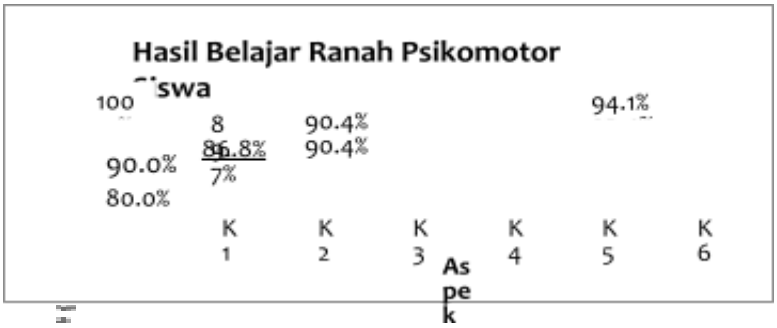
Table 4.4. Results of one party average test analysis

Number of subjects	$\bar{x}$	μ_0	**s**	t_{count}	t_{table}	**Hypothesis**
34	81,0	75	7,20	4,96	1,70	Accepted

According to the results of the analysis using a one-party average test, the t value was obtained$_{count}$ of 4.96, while the t value$_{table}$ obtained is 1.70 with a confidence level of 5%. t value$_{count}$ This is much larger than the t value$_{table}$. This shows that the application of the STAD type cooperative model through the SETS approach to household chemicals material can improve student learning outcomes.

c) Psychomotor Learning Outcomes

Psychomotor learning outcomes are assessed using observation sheets. The scores obtained by students in the observation sheet are converted into percentages. This psychomotor domain assessment was observed by two observers. Observer 1 assesses skills using a measuring cup and observer 2 assesses skills using an O-hauss balance. Assessment is carried out at the end of the meeting by asking students to come forward one by one. The following is a graph of the results of the student's psychomotor assessment.



Graph 4.1 Student psychomotor learning outcomes

Information

K1 : How to put water into a K2 measuring cup
: How to use a pipette
K3 : How to read the scale on a K4 measuring cup : How to calibrate the o-hauss K5 balance : How to show the scale on which K6 is measured : How to see the equilibrium position

From graph 4.1, it shows that the average student is skilled in using practical tools. In

the skill of using a measuring cup, there are three aspects that are assessed. In the aspect of how to put water into a measuring cup the average student score was 89.7%, in the aspect of how to use a pipette the percentage was 90.4%, and in the aspect of how to read a measuring cup with a percentage of 90.4%. In the skills to use the o-hauss balance, there are also three aspects that are assessed. In the aspect of how to calibrate the o-hauss balance, the average student score is 86.8%, at

the aspect of how to show the scale on which the average student score is measured is 94.1%, and in the aspect of how to see the equilibrium position the average student score is 93.4%. The average skill in using a measuring cup and o-hauss balance is included in the very good category, with a percentage of 90.8%. Of all the aspects assessed, the aspect of how to calibrate the instrument received the lowest percentage, because most students tend to rush in calibrating and have not arrived at a truly balanced condition. The complete psychomotor learning results of students are in appendix 30.

d) Affective Learning Outcomes

This affective domain assessment was carried out by 2 observers who observed 7 groups using an affective observation sheet. The affective observation sheet is the same for each meeting which consists of 4 aspects. The following are the results of students' affective observation assessments for both meetings.

Table 4.5 Affective learning results for class VIII-i students

Aspect	P 1	P 2	Rate-rate	Percentage	Category
Discipline	3,1	3,6	3,4	84,0%	Good
Responsibility	3,0	3,7	3,3	83,5%	Good
Express/respond to opinions	3,2	3,6	3,4	86,0%	Good
Cooperate	3,2	3,6	3,4	84,6%	Good
Class average				84,5%	Good

Information:

P1: Meeting 1

P2: Meeting 2

From table 4.5 it can be seen that the student domain score for the discipline aspect was 84% with a score at the first meeting of 3.1 and increasing at the second meeting to 3.6. The highest percentage was obtained by students in the aspect of raising/responding to questions and ideas, where at the first meeting the score was 3.2 and at the second meeting it was 3.6. The lowest percentage was obtained by students in the responsible aspect with scores at meetings I and II respectively of 3.1 and 3.6.

The overall average results show an affective domain percentage of 84.5% which is included in the good category. The overall calculation of affective learning results can be seen in the attachment

31. The percentage of students' affective learning outcomes can be seen in graph 4.2.

Graph 4.2 Student Affective Domain Learning Results

Information:

1. Discipline
2. Responsibility
3. Express/respond to opinions
4. Cooperate

Analysis of Student Responses

Student response data was obtained from student response questionnaires which were distributed to students at the end of the lesson. This questionnaire contains 10 statements regarding students' opinions regarding the learning that has taken place.

Table 4.6. Responses from class VIII-i students

No	Opinion Description	Response (%)	
		Of	No
1.	The learning activities that I participated in were something new for me.	91,2	8,8
2.	The learning activities that I participated in were interesting and enjoyable	100	0
3.	The learning activities that I participate in can train cooperation in groups	100	0
4.	With this group learning model, it is easier for me to understand the concept of household chemicals	94,1	5,9
5	By forming a group, I can ask each other questions and have the courage to express/rebut opinions	97,0	3,0
6	The learning material provided is related to the environment, technology and society	100	0

7	I am more enthusiastic about participating in the learning process in class	97,0	3,0
8	Teachers play more of a directing role when teaching	88,2	11,8
9	The teacher gives explanations that are easy to understand when teaching	91,2	8,2
10	Practical activities and group discussions can help me understand the material	100	0

From table 4.6 it appears that the percentage of students for each statement reached a fairly high number. Of the ten statements, all are in the very good category. The average student response to the learning that took place was 95.3%, which is classified as very good. This shows that STAD type cooperative learning through the SETS approach taught to students can provide a positive response for students and is well received by students.

E. DISCUSSION

Based on data analysis, the teacher's skills in managing the class increased at the second meeting, along with the increase in teacher activity in motivating students by asking questions and communicating discussions about what would be studied. This is because the teacher considers that the material to be studied at meeting II is more difficult compared to the material studied at meeting I because it combines several materials at once, so the teacher provides more motivation to students to increase students' interest and curiosity in studying the material at meeting II. This preliminary aspect obtained the largest percentage, namely 94%.

Good learning begins with the teacher explaining the learning objectives to be achieved. Knowing the learning objectives will help students motivate themselves better. The aspect of motivating students is very important in every learning process. With motivation, students will become interested in studying more deeply the material that will be presented. Students who are motivated to learn something will use higher cognitive processes in studying the material, so that students will absorb and digest the material better (Garner, Alexander, Gillingham, Kulikowick, & Brown in Nur, 2008). Teachers are required to have the ability to arouse student motivation so that they can form competencies and achieve learning goals. The lowest percentage in learning management is the classroom atmosphere, namely 83% because students are still awkward in learning. As stated by Ibrahim (2000), the disadvantage of the STAD cooperative learning model is that students tend not to want to be put together with friends who are less intelligent if they themselves are clever and those who are less clever also feel inferior when combined with friends who are clever, although over time this feeling will disappear with itself

Uno (2007) states that the aim of learning management carried out by teachers is to develop students' abilities in using learning tools, provide conditions that allow students to work and learn, and help students to obtain the expected results. Good learning management will influence student learning outcomes, as evidenced by the large number of students who completed the study, namely 88.2%.

Overall the implementation of learning received a percentage of 89%, so it can be seen that the teacher's skills in implementing the STAD type cooperative learning model with the SETS approach were implemented very well.

Cognitive Learning Outcomes. The completeness of student learning outcomes can be seen from the cognitive learning results given at the last meeting. There were 30 students who completed the household chemicals material after following the learning process using the STAD type cooperative with the SETS approach and 4 students who did not complete it. The students' completeness was due to group learning and good cooperation in the group. This is in line with Ibrahim's statement (injauhar, 2011) that the application of cooperative learning can improve student academic learning outcomes and develop social skills. As many as 94.1% of students stated that with the group learning model it was easier for students to understand the concept of household chemicals.

Another factor is the great motivation of students in carrying out practicums. This can be seen from the learning implementation data that 94% of students carry out experiments and 81% of students are enthusiastic in class. The practicum carried out is related to simple technology by linking elements of science, environment and society, so that students gain a deeper understanding of the knowledge they have. Learning with the SETS approach allows students to gain deeper knowledge than learning with a non-SETS approach as stated by Binadja (in Lestari, n.d.).

Meanwhile, some students have not completed it due to students' lack of understanding of certain subjects, this can be seen from the two indicators of incomplete questions, namely 61% and 71%. Apart from that, household chemicals that are presented in an integrated manner are something new for students and teachers only provide basic information, possibly making some students less familiar with the material so that their cognitive learning outcomes are low. Another factor is the form of integrated science questions with a fairly high level of difficulty covering domains C2, C3, C4 and C5 as well as the use of descriptive questions in the test.

In the one-party average test, the result t is obtained$_{count}$ greater than t_{table} (4.96>1.70), so it was concluded that the use of the STAD type cooperative learning model with the SETS approach could improve student learning outcomes to reach a KKM score of 75.

Increasing student learning outcomes is also supported by quizzes that encourage students to contribute as many points as possible to obtain group awards. After the results of the first quiz are announced at the second meeting, the scores

the increase in each group increases. This can be seen from the average quiz result at the first meeting of 23.2 and 28.7 at the second meeting. According to research resultsArmstrong, Palmer, & Jesse (1998) found that competition for awards made classes more interesting and made it easier to understand the material.

Psychomotor Learning Outcomes.The average student psychomotor learning outcomes reached 90.8% in the very good category. This is because students are actively involved in practicing using tools when doing practicum in class and there is a peer tutor role. This is in line with Nur's (2011) statement that the main idea behind STAD is to motivate students to encourage each other and help each other in completing the skills presented by the teacher, as evidenced by student responses as many as 97% of students stated that they were more enthusiastic about participating in class learning. This is also supported by the use of the SETS approach in learning which trains skills in using tools so that they can produce a technological product, as stated by Binadja (in Purnomo, 2011) that the characteristic of SETS is that students are brought into situations to utilize scientific concepts into technological forms for the benefit of public.

The lowest percentage aspect is how to calibrate the instrument at 86.8%, this is because some students are still in a hurry to calibrate, and have started weighing even though the balance position of the balance is not yet perfect.

Affective Learning Outcomes.Affective assessment is carried out using a rubric and carried out during learning. All students completed with an average of 84.5% in the good category. The average score increased at the second meeting because students were ready to adapt well to their groups so that good cooperation was established. This is in line with Ibrahim's opinion (injauhar, 2011) that the goal of cooperative learning is broad acceptance of people who are different based on race, culture, social class, abilities and disabilities.

The highest average score was in the aspect of asking questions/responding to friends' opinions at 84.6%. This is possible because of the supportive learning atmosphere, which is included in the very good category. Apart from that, the SETS approach applied in learning is close to social life, technology and the environment so that it is possible for students to ask lots of questions and encourage other students to respond to other students' questions.

Based on the analysis of student responses to learning, it shows that students respond positively to learning activities in class. This is shown by 100% of students stating that

learning activities are interesting and fun, and 97% of students are more enthusiastic about participating in class learning.

The percentage of students who agree that group learning can make them understand the material better is 94% and they can ask each other questions with friends is 97%. Thus the students have done a good tutorial job and cooperate with each other.

As many as 100% of students responded positively to the statement that cooperative learning activities can foster cooperation, critical thinking and the ability to help friends.

As many as 100% of students agreed with the practicum activities and group discussions, this was because the practicum activities gave an interesting impression and had a reciprocal relationship with science, the environment and society. In line with research conducted by Achmad Binadja, Sri Wardani, Sigit Nugroho (2008) concluded that learning with a SETS vision forms a positive impression in students and the positive impression that arises from learning with a SETS vision has a positive effect on student learning outcomes.

As many as 88% of students stated that teachers played more of a directing role when teaching. In the learning process, teachers change learning from*teacher centered* become*student centered,* This is in accordance with the advantages of the STAD type cooperative learning model.

The average student response to the implementation of STAD type co-operative learning with the SETS approach is positive. With the excellent quality of implementation of the learning model, students can solve difficult things together and can improve student learning outcomes both individually and in groups.

F. CONCLUSION

Based on the analysis and discussion that has been described, it can be concluded that the application of STAD type cooperative learning with the SETS approach can improve student learning outcomes in household chemicals at SMPN 1 Arosbaya, with a description of the answers to the research questions as follows: 1) Learning management activities carried out The teacher shows that the teacher has managed the class very well in every aspect including introduction, main activities, closing, class management and class atmosphere with an average of 89%. 2) The cognitive learning outcomes of class VIII-i students reached an average of 81.0 with classical completeness of 88.2%, which shows that class VIII-i students have met the standards for classical completeness set by the Ministry of National Education. Student psychomotor learning outcomes reached a percentage of 90.8% in the very good category and student affective learning outcomes reached a percentage of 84.5% in the

good category. 3) Students respond positively to learning as seen by enthusiasm and activeness in the learning process.

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