Unesa Journal of Chemical Education *ISSN: 2252-9454*
Vol. 7, No. 2, pp 180-186 May 2018

IMPLEMENTATION OF COOPERATIVE LEARNING TYPE TWO STAY TWO STRAY (TSTS) ON REACTION RATE MATTER TO TRAIN STUDENT'S SELF EFFICACY GRADE XI

Frissa Rizkihati Prastika, *Dian Novita, and Rusly Hidayah
Chemistry Department FMIPA Universitas Negeri Surabaya
email: diannovita@unesa.ac.id

Abstract

The aims of this research are to know implementation of cooperative learning model type Two Stay Two Stray on reaction rate matter, to describe student's self efficacy and to know student's reponses on reaction rate matter through the implementation of cooperative learning model type Two Stay Two Stray (TSTS). This research data analyzed by One Group Pretest-Posttest Design. This research was done for three meetings. Instruments that used in this research are implementation observation sheet, questionnaire and observation sheet of student's self efficacy and student's responses. It can be concluded that (1) Implementation of cooperative learning type Two Stay Two Stray was 100%; 93.75% and 97.92% in very good category, (2) Student's self efficacy in level dimension is 76.65 in good category and strength dimension is 74.80 in good category, (3) Student's responses is ≥61%, so it is in very good category. So it can be concluded that cooperative learning model type Two Stay Two Stray can be used to train student's self efficacy at XI MIPA 3 SMA Negeri I Manyar.
Keywords: Cooperative Two Stay Two Stray, Self Efficacy, Reaction Rate.

INTRODUCTION

According to UU No. 20 of 2003 about National Education System in Chapter I Article 1 stated that education is a conscious effort and planned to create an atmosphere of learning and learning process so the learners are actively developing their potential to have spiritual strength, self-control, personality, intelligence, noble character, as well as the necessary skills of himself, society, nation and state [1].

The progress of science and technology is very influential on education. To achieve the educational demand due to the science and technology is by improving the quality of education in every level of education through curriculum development. Curriculum development aims to improve the quality of education in Indonesia, so Indonesian people can be a master of knowledge.

According to Regulation of the Minister of Education and Culture No. 20 of 2016 about competency standards of graduates, every graduate of the primary education has competence on three dimensions, there are attitude, knowledge and skill [2]. One of the dimensions of attitudes that students need to have is self efficacy.

Self efficacy is a person's belief about self-ability to produce a problem solving that can affect student life. Self efficacy possessed by a person can be viewed based on three dimensions, (1) Level is the difference about difficulty of individual tasks, (2) Strength is associated with individual belief in achieving certain results, and (3) Generality is related to the flexibility of individuals who can be used for different situations [3].

Student's self efficacy can be grown through the effective learning. Effective learning has the effective indicators: (1) achievement of learning both individually and classically, (2) student activity during learning process influences on learning achievement [4], in this case on chemistry subject because the concept in chemistry is an abstract and complex concept.

One of the complex concepts in chemistry learning is the concept on the subject matter of the Reaction Rate.

Based on the results of pre-research that has been done as much as 81.4% of students said that teacher just explain all the matter and make

students less understand the reaction rate matter so that required learning strategies that can engage students in learning.

Lie stated that effective learning strategy is a learning that can involve students in discussion with whole class, that is by cooperative learning [4]. One type of cooperative learning model is Two Stay Two Stray. Through this cooperative learning model students are expected to express their opinions in group themselves, then in other group. Syntax of Two Stay Two Stray also gives the group the opportunity to share the results and information with other group. Through this type of Two Stay Two Stray students are divided into heterogeneous groups, each of 4 to 5 students. They discuss together to make a report. Then two students from each group will be show their report to another group. Two students who live in their group are in charge of dividing the work or responsible to convey information to the guests [5].

Cooperative learning type Two Stay Two Stray is also able to facilitate students to understand the concept of reaction rate matter, because students are given the freedom to pour creativity at the time of discussion [6]. Then the ability of self efficacy of students is also still relatively low, because based on the pre-research 92.9% of students are still cheating.

In cooperative learning model type Two Stay Two Stray, students are working in groups. When reporting to other group also in pairs (2 students) so that students are expected not nervous when show the results of the discussion to other group. This is consistent with the advantages of Two Stay Two Stray learning model are students will dare to express their opinions, increase student's self efficacy and student's speaking can be improved [7].

Based on the above descriptions, the researcher considers it necessary to apply the implementation of cooperative learning model type Two Stay Two Stray (TSTS) on reaction rate matter to train the student's self efficacy grade XI.

METHOD

This type of research is a pre-experiment design with one group pretest-posttest design.

O1 – X – O2

[9]

Explanation:

O_1 : Test before implementation of Two Stay Two Stray learning model on reaction rate matter

X : Treatment for implementation of Two Stay Two Stray learning model on reaction rate matter

O_2 : Test after implementation of Two Stay Two Stray learning model on reaction rate matter

The data from the observation sheet of the implementation of Two Stay Two Stray cooperative learning model are used to know the implementation of Two Stay Two Stray cooperative learning model during the learning process. Self efficacy capability is measured by questionnaire and self efficacy observation sheet and supported by the value of student learning outcomes during pretest and posttest in the form of multiple choice questions. Student response is the response of students after following the learning with the implementation of cooperative learning model type Two Stay Two Stray on the reaction rate matter.

The scoring for assessment of the implementation of the learning model is analyzed by using the following formula:

$$\%\ Implementation\ learning\ model = \frac{\sum Total\ Score}{Maximum\ Score}\ x\ 100\%$$

The data obtained then converted into the following scores:

Table 1. Percentage of Learning Activity

Percentage (%)	Criteria
0-20	Very Low
21-40	Low
41-60	Medium
61-80	Good
81-100	Very Good

[8]

The learning activity is also supported with student activity appearing every 3 minute period with formula:

$$\%\ Student\ activity = \frac{frequency\ of\ activity\ that\ appear}{\Sigma\ frequency\ of\ overall\ activity} x100\%$$

Self efficacy analysis obtained from questionnaire data with criteria of positive and negative questions as follows:

Table 2. Likert's Scale for Positive and Negative Question

No.	Question Criteria	Student Response	Score
1	Positive	Very agree	4
		Agree	3
		Not agree	2
		Very not agree	1
2	Negative	Very not agree	4
		Not agree	3
		Agree	2
		Very agree	1

[8]

Then put in the calculation:

$$Score\ of\ self\ efficacy = \frac{score\ that\ obtain}{maximum\ score} x100$$

Data that obtained then converted into the following scores:

Table 3. Score of Self Efficacy

Score	Category
1-20	Very Low
21-40	Low
41-60	Medium
61-80	Good
81-100	Very Good

[8]

Self efficacy is also supported by the value of posttest by the formula:

$$Score = \frac{score\ that\ obtain}{maximum\ score} x100$$

Students complete when reaching KKM that is ≥75.

Analysis of student responses to the learning process is based on Guttman scale in the form of statement as follows:

Table 4. Guttman Scale Score

Answer Category	Score
Yes	1
No	0

[9]

Data of student responses result is analyzed descriptively quantitatively by describe percentage in each question. Calculation of each category is analyzed by percentage as follows:

$$Percentage\ of\ answer = \frac{\Sigma\ answer\ Yes/No}{\Sigma\ Respondent} x100\%$$

Results from questionnaire responses then analyzed with the following criteria:

Table 5. Criteria Results Response Questionnaire

Percentage (%)	Category
0-20	Very Low
21-40	Low
41-60	Medium
61-80	Good
81-100	Very Good

[8]

RESULT AND DISCUSSION

The observation result of the implementation of cooperative learning model type Two Stay Two Stray in 3 meetings:

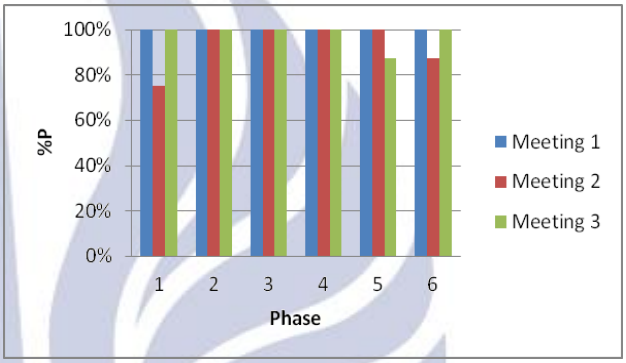


Figure 1. Implementation of Two Stay Two Stray Learning Model

In the figure can be seen that the implementation of cooperative learning model type Two Stay Two Stray obtained percentage of 100%; 93.75%; 97.92% with very good category. So, can be conclude that the learning is doing very well.Cooperative learning refers to learning strategies that students will work together in group that help each other in learning.

In cooperative learning type Two Stay Two Stray that can train self efficacy is in fourth phase. In this fourth phase students have to discuss in group themselves and other group, so students are trained to have self efficacy in actions that will be done, that is self efficacy in level dimension and in order to be realized in achieving certain results (performance), which shows self efficacy in the strength dimension.

The purpose of this cooperative learning is to create individual success determined by the success of the group. While the goal of small grouping in learning is to provide opportunities for students involved in the learning process (in groups) to be more active in the thinking process and in learning activities [10].

Cooperative learning model type Two Stay Two Stray can help students on learning process individually or in group and also can train student's self efficacy. This is shown from the syntax of cooperative learning model type Two Stay Two Stray where this model is expected to bring the courage students in expressing opinions on the group itself, then another group.

Assessment of self efficacy is obtained from questionnaire as main data and observation as supporting data, beside that also supported with result of student learning. Questionnaire and observation of self efficacy are divided into two, there are level and strength dimensions.

Questionnaire of self efficacy contains 8 statements that are adjusted to their dimensions and consist of positive and negative statements so that to know student's self efficacy not only from one side only, but from two sides. The results of the average self efficacy's questionnaire for three meetings can be seen in the table:

Table 6. Score of Self Efficacy Questionnaire

No.	Name of Student	Score of Self Efficacy		
		Meeting 1	Meeting 2	Meeting 3
1.	ADWS	62.5	78.1	87.6
2.	AIA	56.25	65.7	72
3.	ASR	75	87.5	84.4
4.	ARA	50	68.8	84.4
5.	AMR	56.3	68.8	68.8
6.	AMP	53.2	62.5	65.7
7.	AT	59.4	62.5	84.4
8.	BBK	59.4	72	72
9.	CMN	46.9	50	53.2
10.	DWP	53.2	65.7	75
11.	DAPU	65.7	75	75
12.	EDO	72	84.4	75
13.	FHS	62.5	62.5	71.9
14.	FGP	62.5	68.8	65.7
15.	FLAA	72	81.3	84.4
16.	FSK	75	81.3	75
17.	HDY	75	90.7	84.4
18.	KZ	78.2	90.7	75
19.	KD	78.2	90.7	90.7
20.	MK	68.8	75	75
21.	MAF	65.7	78.2	84.4
22.	MUAA	90.7	97	97
23.	NAR	72	97	96.9
24.	PK	72	87.6	90.7
25.	RZA	84.4	90.7	84.4
26.	RRR	72	81.3	96.9
27.	SF	68.8	81.3	87.5
28.	STA	75	87.5	90.7
29.	WNA	81.3	93.8	90.7
30.	YM	68.8	87.6	87.6
31.	YZF	65.7	71.9	84.4
32.	ZH	68.8	75	84.4
33.	ZFH	65.7	75	84.4
Average		65.7	78.4	81.2
Category		Good	Good	Very Good

Based on the table can be known the average score of self efficacy's questionnaire for three meetings always increased with good and very good category.

In addition to using self efficacy's questionnaire data, the researcher also uses self efficacy's observation sheet as supporting data, observed through self efficacy behavior at level dimension is student feel optimistic in discussing with group of themselves and other group to work on problem in LKS and got average score of observation result is 89.6 in very good category. While on the strength dimension is student feel interested in working on the application problem without the influence of others and obtained the average value of observations is 81 in the very well category.

Student learning result data is also data supporting of self efficacy. Problems given on the test result of learning in the form of objective questions (multiple choice) and on posttest obtained the percentage of classical for three meeting is 77%; 84%; 78%.

Slavin explains that two factors that can affect student learning are internal and external factors [10]. Internal factors are factors that come from inside, such as health, sense of security, self

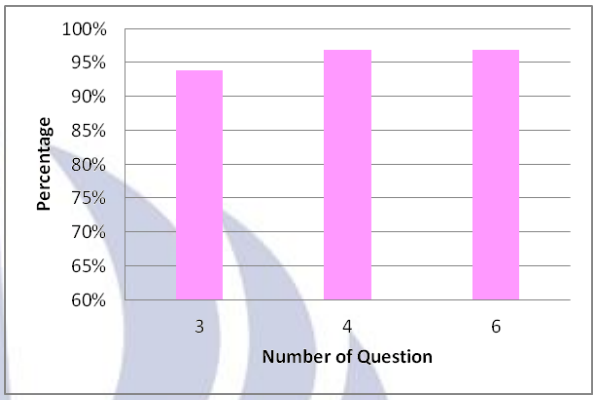
efficacy and interest, while external factors are factors that come from outside, such as the ability of teachers in applying the model of learning, class cleanliness, so that in the study of self efficacy of students successfully trained and experienced improvement. This is reinforced by Adelson's research [11] which states that students with high self efficacy get high learning score as well.

Student's responses is the responses given by the students after implementing cooperative learning model type Two Stay Two Stray on reaction rate matter to train of student's self efficacy. The result of student's responses are obtained from the student response's questionnaire that contains the statement relating to the learning process of cooperative learning model type Two Stay Two Stray. The statement are divided into 2, there are positive and negative statements. The student's responses will get a positive result if the percentage earned ≥61%. Here is statements that used in the student response's questionnaire:

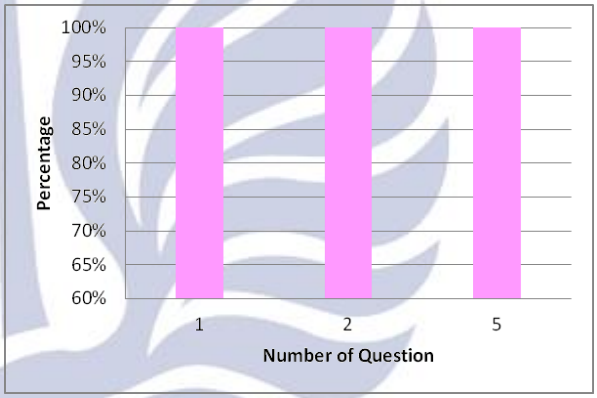
Table 7. Statement of Responses Questionnaire

No	Statement	
	Positive	Negative
1		I am not happy to attend lessons with group system learning
2		I am not happy to take a reaction rate matter with a discussion consisting of 4-5 students
3	I feel my self efficacy more trained by this kind of learning process	
4	I understand all the matter that given by the teacher with the Two Stay Two Stray cooperative learning model	
5		Practicum make me not understand about the concept of reaction rate matter
6	I want learning that has been applied, can be re-applied to other matter	

Results of student responses can be seen in the graph below:



Picture 3. Result of Student's Response for Positive Statement



Picture 4. Result of Student's Response for Negative Statement

Positive statements are statements number 3, 4, 6. Percentage of number 3 is 93.93% in very good category. Percentage of number 4 is 96.96% in very good category. Percentage of number 6 is 96.96% in very good category.

Negative statements are statements number 1, 2, 5. Percentage of number 1 is 100% in very good category. Percentage of number 2 is 100% in very good category. Percentage of number 5 is 100% in very good category.

In student questionnaire graph above shows that the Two Stay Two Stray cooperative learning model to train student's self efficacy on reaction rate matter during three meetings can be very well received.

CLOSURE

Conclusion

Based on the formulation of problems and discussion of the implementation of cooperative learning model type Two Stay Two Stray (TSTS) on the reaction rate matter to train student's self efficacy of high school grade XI can be concluded that:

1. Implementation of cooperative learning type Two Stay Two Stray (TSTS) on the reaction rate matter to train student's self efficacy of high school grade XI has obtained a percentage of 100% at the meeting 1; 93.75% at the 2nd meeting; and 97.92% at the 3rd meeting. This is shows that the learning done during the three meetings runs well, because the quality of cooperative learning model type Two Stay Two Stray in very good category.
2. The average value of self efficacy of students in each dimension after the implementation of cooperative learning model type Two Stay Two Stray on reaction rate matter that shows level dimension is 76.65 in good category. While strength dimension is 74.80 in good category.
3. Student's responses after get cooperative learning model type Two Stay Two Stray (TSTS) on the reaction rate matter to train student's self efficacy of high school grade XI MIPA 3 in SMA Negeri I Manyar Gresik obtained results, that is for positive statements for three meetings were 93.9%; 96.9%; 96.9% in very good category. As for negative statements for three meetings were 100%; 100%; 100% in very good category.

Suggestion

1. Before implementing cooperative learning model type Two Stay Two Stray (TSTS), better to have a good time management so that every learning syntax can be done well.
2. When observing self efficacy, one observer has observed 4-5 students, whereas to assess self efficacy requires accurate accuracy. Therefore for the next researcher it is recommended to reduce the number of students observed to obtain optimal results.
3. Researchers conduct research to train student's self efficacy capability during three meetings. To maintain self efficacy in students, it is expected for other researchers when trained student's self efficacy with a longer period of time in order to maintain student's self efficacy who have formed.

REFERENCES

1. Lampiran Permendikbud. 2016. Kurikulum Departemen Pendidikan Nasional, 2003. *Undang-Undang Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. Jakarta: Depdiknas.
2. Kemendikbud. 2016. *Permendikbud No. 20 Tahun 2016 Tentang Standar Kompetensi Lulusan*. Jakarta: kementrian Pendidikan Nasional.
3. Bandura, A. 1997. *Self-efficacy: The Exercise of Control*. New York: Freeman.
4. Junaryadi. 2012. *Pengembangan Perangkat Pembelajaran Matematika Model Kooperatif Tipe Two Stay Two Stray Dengan Pendekatan Konstruktivisme Untuk Meningkatkan Kemampuan Komunikasi Matematis Siswa*. Journal of Primary Educational.
5. Handayani, Gigih Cahyaning Putri dan Novita, Dian. 2017. *Penerapan Model Pembelajaran Kooperatif Tipe Two Stay Two Stray untuk Melatihkan Karakter dan Meningkatkan Hasil Belajar Pada Materi Laju Reaksi di SMA Negeri 1 Krembung Sidoarjo*. Unesa Journal of Chemical Education. Vol. 6, No. 1, Tahun 2017.
6. Guretno. 2015. *Pengaruh Model Pembelajaran Kooperatif Teknik Two Stay Two Stray (TSTS) dan Aktivitas Belajar Terhadap Hasil Belajar Siswa Kelas VII Di SMPN 1 Panji Situbondo*. Jurnal Penelitian dan Pendidikan IPS (JPPI). Vol. 9, No. 2, pp. 1181-1197, Tahun 2015.
7. Simanungkalit. 2009. *Upaya Meningkatkan Aktivitas dan Hasil Belajar Akuntansi dengan Model Cooperative Learning Tipe Two Stay Two Stray pada Standar Kompetensi Persamaan Dasar Akuntansi di Kelas X Ak 5 SMK Negeri 7 Medan Tahun Pelajaran 2009/2010*. Medan: UNIMED.
8. Riduwan. 2012. *Metode & Teknik Menyusun Proposal Penelitian*. Bandung: Alfabeta.
9. Sugiyono. 2010. *Metode Penelitian Kuantitatif Kualitatif & RND*. Bandung: Alfabeta.
10. Slavin, Robert E. 2005. *Cooperative Learning*. London: Allymand Bacon.

11. Adelson, Jill L; Niehaus, Kate; dan Rudasill, Kathleen Moritz. 2012. *Self-Efficacy, Intrinsic Motivation, and Academic Outcomes among Latino Middle School Students Participating in an After-School Program*. USA: University of Louisville.