

THE APPLICATION OF COOPERATIVE LEARNING STRATEGY PEER TEACHING MODEL ON BIOLOGY LEARNING RESULT

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui hasil belajar peserta didik biologi pada materi sistem pencernaan dengan menggunakan pembelajaran *Cooperative Learning* model peerteaching sebaya. Penelitian dilakukan di Universitas Islam Negeri Sumatera Utara pada mahapeserta didik biologi semester 2 tahun ajaran 2016/2017. Data diperoleh dari kemampuan mahapeserta didik mengerjakan soal pretest dan postest. Proses pembelajaran dilakukan sesuai dengan *sintak* pembelajaran peerteaching sebaya. Hasil penelitian menunjukkan peningkatan hasil belajar dari nilai pretest dan postest.

Kata Kunci: *cooperative learning*, Hasil Belajar Biologi dan *Peerteaching Sebaya*.

ABSTRACT

This study aims to determine the learning outcomes of biology learners on the material digestive system by using learning Cooperative Learning peer peerteaching model. The study was conducted at the State Islamic University of North Sumatra in mahapeserta biology semester 2 academic year 2016/2017. Data obtained from the ability mahapeserta educate do the pretest and postest questions. The learning process is done in accordance with peer peerteaching learning syntax. The results showed an increase in learning outcomes from pretest and posttest values.

Key Words: *cooperative learning*, Biology Learning Result and *peer teaching*

A. INTRODUCTION

Education is a spear of success in shaping human character. Education can be obtained from formal and informal institutions. School is one of the formal educational institutions to produce a generation of quality nations. The education system in school is in the spotlight whether it is seen from the school's equipment

or anything that supports it. The success of a learner is seen how the learning process in the classroom. In the process of learning an educator must be able to deliver material well that not only teaches through the lecture method but is able to use other methods.

Educators consciously try to set the learning environment to be passionate for the students. "With a set of theories and experiences, teachers use for how to prepare the teaching program well and systematically". Educators must have a strategy so that learners can learn effectively and efficiently, on the expected goals. So one of the urgency of education that must be educators are mastered and applied is to use learning methods where the goal is to facilitate the delivery of learning materials to learners. To encourage teachers' success in teaching and learning process is to understand the function of implementing learning methods. The important thing in the method is that each learning method used is related to the learning objectives to be achieved. The purpose of educating the child to be able to solve problems in learning, requires another method, if the purpose of collecting information.

Cooperative learning strategy peer peerteaching model into one of the alternatives that can be done by educators to generate interest and passion in learning. This strategy is done with a small group where a learner who is considered capable of understanding the subject matter can share his knowledge to a friend who lacks understanding of the subject matter. Studying help by peers can eliminate awkwardness so that a taught friend is not ashamed to reveal the difficulties he or she encounters. To determine the peerteaching, educators can see from the academic development of learners such as high rank in the class, Able to establish cooperation with other students and have high motivation to make the discussion group as the best. The learning objectives of this peer group model are to provide opportunities for learners to develop their ability to solve problems rationally, to develop social and cooperative spirit in life, to dominate group activities in learning and each member feels comparable Self as a responsible group, develop leadership skills, skills for each group member in solving group problems. Thus through cooperative learning peer peerteaching model can

improve students' understanding of the subject matter that can improve their learning biology.

B. Research Methods

This research was conducted at State Islamic University of North Sumatera semester 2 of academic year 2016/2017 at mahapeserta learn PBIO 1.

Data collected by the researcher is in the form of biology learning result data obtained by using the test instrument of learning result by using multiple choice question which is given as the ability test of the learner. This research includes quasi experimental research, while the approach used is quantitative approach by using statistical analysis of T test with SPSS Ver 24.00. Before the analysis test done first done the prerequisite analysis that is using normality test and homogeneity test.

C. Results

1. Initial Test Description Learning outcomes

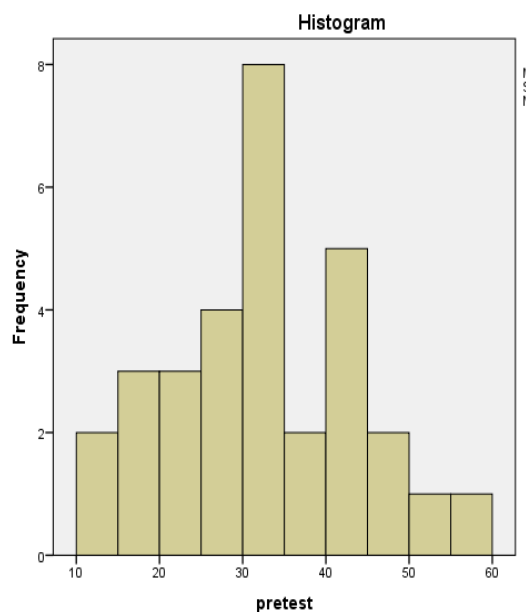
Prior to experimental treatment is also applied first pretest test (pretes) on learning outcomes. The result of initial test of biology learning result of students can be seen in Table 1. **Tabel 1. First Description of Students' Biology Result**

Statistics

pretest

N	Valid	31
	Missing	0
Mean		31,65
Median		30,00
Mode		27 ^a
Std. Deviation		11,292

Variance	127,503
Range	47
Minimum	10
Maximum	57
Sum	981



From the results of the analysis on pretest it can be seen that the average value of students is 31.65. This happens because students learn not get.

2. Description of Final Test Result of Biology Learning Result

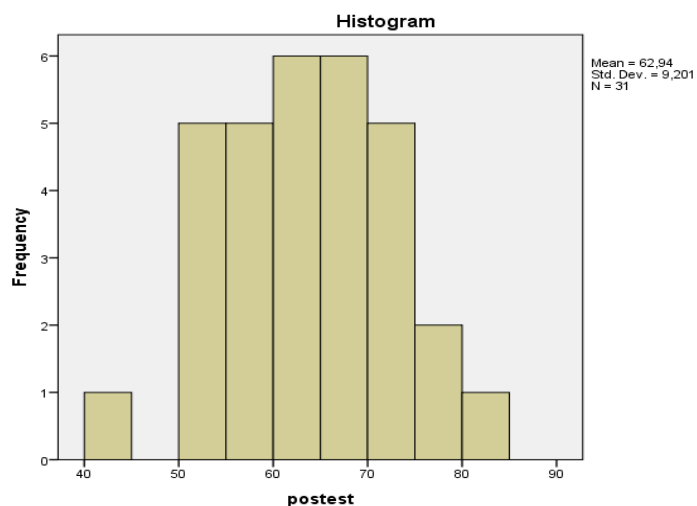
After the experimental treatment is applied, then the next step is also done a final test (postes) to determine the effect of treatment to improve learning outcomes biology learners. The result of final test of biology study result of students can be seen in Table 2.

Tabel 2. Final Description of Students' Biology Result

Statistics

postest

N	Valid	31
	Missing	0
Mean		62,94
Median		63,00
Mode		67
Std. Deviation		9,201
Variance		84,662
Range		40
Minimum		43
Maximum		83
Sum		1951



From the results of the analysis on the posttest it can be seen that the average value of the students is 62,94. Increased learning outcomes in students after the treatment as cooperative learning model peer peerteaching.

3. Test Requirements Analysis

Prior to analysis testing in proving the hypothesis first tested the requirements of inferential statistical analysis. The requirements test comprised the data normality test using the Shapiro-Wilk Test at a 0.05 significance level. Test homogeneity of data variance using Levene's homogeneity test at significant level of 0,05. Data analysis using SPSS software version 24.0.

A. Test of Normality of Biology Learning Result

Result of normality test by using statistic test Kolmogorov Smirnov from learning result of pretest and posttest, that is test result of normality of pretest knowledge data of biology study result can be seen in Table 3.

Tabel 3. Normality Test of Biology Result

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
pretest	,097	31	,200*	,985	31	,938
posttest	,122	31	,200*	,981	31	,852

The results of the Shapiro-wilk test shown in Table 3 show that the final test result of the biology learning result of the Mahapos and the Shapiro-wilk values is greater than probability or $p > 0.05$ (Asymp Sig. (2-tailed)), it can be concluded That the test data of mahoghic biology learning result above is normal distribution, or fulfill requirement of normality test.

B. Homogeneity Test of Variance

The results of homogeneity testing using Levene's statistical test of learning outcomes of mahogany and biology learn can be seen in summary in Table 4.

Tabel 4. Homogeneity Test of Biology Result

Test of Homogeneity of Variances

Hasil_Belajar

Levene Statistic	df1	df2	Sig.
,824	1	60	,368

Levene's test results in Table 4 show Significant value > α (0.05) thus satisfying the homogeneity test requirements.

C. Hypothesis testing

The result difference by using SPSS ver 24.0 on the result of biology learning on the material of digestive system. Summarize the results of the analysis calculations in Table 5.

Tabel 5. Homogeneity Test of Biology Result

Paired Samples Test

Paired Differences	t	df	Sig.
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Pair	Posttest	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	(2-tailed)
					Lower	Upper			
1	-pretest	31,290	8,215	1,475	28,277	34,303	21,208	30	,000

Based on the t test according to Table 5, the value of t arithmetic is 21,208 with probability 0.000 which means accept alternative hypothesis (Ha) and reject the nil alternative (H0). Thus there is a difference in the average of biology learning outcomes before and after being taught with cooperative learning strategies Peer Teaching model on digestive system material.

D. Discussion

The use of cooperative learning strategy of peer peerteaching model on the result of biology study of students and students was analyzed by Paired t Test (pairwise t test). The result of analysis test is $t_{count} > t_{table}$ that is $21,208 > 2,04$ and probability value $0,000 < 0,05$. Thus, accept Ha or rejected H0 so it is concluded there is a significant effect of applying cooperative learning strategy of peer peerteaching model to biology learning result educational biology UIN SU.

Peerteachingial is guidance of direction, direction, and motivation so that learners learn efficiently and effectively. Subjects or personnel who provide guidance in peerteachingial activities are known as peerteachings. Peerteachings can come from teachers or instructors, trainers, structural officials, or even learners who are selected and assigned educators to help their friends in classroom learning.

RI Law no. 20 of 2003 on National Education System explained that educators are qualified personnel as teachers, lecturers, counselors, guardians, widyaiswara, instructor peerteachings, facilitators and other titles ayng in accordance with the specificity, and participate in conducting education.

Thus peerteachings can be done by peers who have a higher ability than the friend who taught. Peers in question is a friend whose age is relatively the same or his classmate or friend sebangkunya.

Peer teaching is a learning method with a cooperative approach in which learners have a role as a teacher (usually more intelligent learners than other learners) and other learners act as learners, whether at the same age or age Older than the learner, to help learn at the same grade level, to develop better ability to listen, concentrate, and understand what is learned in a meaningful way, since the explanations are given in a more intimate language. Teaching will be more effective when all the preparation for teaching is well prepared from teaching materials to tools to support teaching available, so that the delivery of information can be right on target, all stimulus (stimulus) to attract interest and learning motivation easy to do, and a more conducive learning process And fun is realized.

Djamarah devised a pattern of steps used in applying group learning guidance with peer peerteachings as follows:

1. Choosing as many as 4-5 peerteachings with conditions:
 - a. Included in the top 10 ranking based on the value of the report cards or the value of previous evaluation.
 - b. Can master the subject matter.
2. Grouping learners into groups.
3. Grouping is done according to the level of intelligence of learners, ie each group consists of students smart, medium and less.
4. Discuss some examples of problems related to the material being taught.
5. Provide guidance in accordance with the difficulties faced by students with the help of peer peerteachings.

The stages of action planning using peer peerteaching methods are as follows:

- a. Create a program, ie as a plan both teachers and peerteachings in doing their duties.
- b. Preparing the peerteaching for the learning process done by peer peerteachings can be done optimally, need a peerteaching who is really able to teach his friend.

c. Preparing facilities and infrastructure. Facilities and infrastructure are also very important in the learning process, for that before the learning process takes place and in the overall check.

Steps of peer peerteaching methods in peer peerteaching learning methods in groups are required as follows:

1) Material selection

Choose material that allows the material to be learned by the students independently. The material is divided into sub-material (material segment).

2) Division of groups

Divide the learners into groups that will be conveyed by educators. Learners who are smarter are divided into each group who will act as peerteachings.

3) Material distribution

Each group is given the task of studying one sub-material and each group will be guided by the more intelligent learners (peerteachings).

4) Time

Give the learners enough time to prepare both in class and out of class.

5) Group discussion

When all groups are at work, it is better for the educator to take turns coming to the group, and can help in case of misunderstanding. But not trying to take over the leadership of the group.

6) Team report

Each group through the representatives of the peerteaching convey the development of his friends who peerteachinged and convey obstacles or difficulties when teaching him about dribble to educators. The educator acts as the keynote speaker.

7) Conclusion

After educators know the obstacles or difficulties faced by learners, educators provide explanations, and correct the understanding of students who are still wrong. Then the educator gives a conclusion to what has been learned.

8) Test

Divide the test questions and give enough time for all learners to solve them. With the results of this test serves to measure the success of peer peerteachinging methods in learning.

While Abu Ahmadi and Widodo Supriyono stated that the peerteachingial activities are divided into 4, namely stabilization, enrichment, guidance, and improvement. The four types of activities can be described as follows:

1. Stabilization, which strengthens the knowledge that has been owned by learners with material that has been studied previously
2. Enrichment, which is to broaden the knowledge and experience of learners so that things learned will be more clear, broad and integrated
3. Guidance, which helps learners in overcoming difficulties and problem solving
4. Improvement, which is to foster the learners in the way of independent learning

Educators in peer peerteaching learning act as facilitators, mediators and evaluators so that the role of learners is more dominant because the role of educators as teachers has been taken over by learners. Educators prepare everything needed in the learning process so that learners do not experience difficulties and the learning process goes smoothly. Educators also reinforce the results of the discussion group. Acting as a mediator, the educator as an intermediary between friends who aims to create the maximum interactive quality of the environment, and the last as an evaluator educator to assess whether the objectives have been planned accordingly and whether the learners have mastered the material being studied.

Related to this, Silberman (2009) explains that some experts believe one subject will really be mastered only if learners are able to teach to other students, because by teaching peers can provide opportunities for learners to learn a material At the same time as he is a peerteaching to others, thus the strategy is a practical way to produce peerteachings in the classroom that can ultimately provide assistance to his friends, since in fact the peer peerteaching is one or several learners appointed by the educator to Become assistant educator in giving guidance to his classmates (Arikunto, et.al, 2012).

These results are in accordance with the Lathifah Annur Research (2009), Huda (2009) and Rachmiati (2010) concluded that there is an improvement in the quality of learning through the application of peer peerteaching learning models in small groups.

This learning strategy provides an opportunity for students to be cooperative rather than competitive. Learners who give explanations to their friends will feel proud of his role. In this strategy also raises the nature of mutual respect and respect for peers. When they learn with peer peerteachings, learners develop better abilities to listen, concentrate, and understand what is learned in a meaningful way. Explanation through peerteachingsebaya to his friend more successful than educatorsebaya. Learners see problems in different ways than adults and they use a more familiar language. Peer education does not have to be the most intelligent learners in class, but of course the learners have mastered the material or subject matter that will be delivered. The same thing expressed Djamarah and Aswan (1996) that to determine who is used as peerteachings, necessary considerations. A peerteaching is not necessarily the smartest learner, the most important to note that the peerteaching is:

- a. Can be accepted by learners who get improvement program so that learners have no fear or reluctant to ask him.
- b. Not hardened, cruel or hard-hearted towards fellow comrades.
- c. Have sufficient creativity to provide guidance, which can explain the lesson to peers.
- d. Can explain materials or materials needed repairs learners who receive improvement program.

In addition to this the learning objectives of this peer peerteaching model are:

- Provide opportunities for learners to develop their ability to solve problems rationally.
- Developing social and cooperative morale in life, dominating group activities in learning and each member feeling self-conscious as a responsible group.

- Develop leadership skills, skills for each group member in solving group problems.

The application of peer peerteaching methods initially aims to provide peerteaching for learners who have learning difficulties. In the development of the world of education as now peer peerteaching methods began to be applied in some schools with the aim to attract the attention of learners so that learning achievement increases. The goal peerteaching learning is to improve the learning achievement of children and generate the motivation of the atmosphere discipline and comfortable.

The tutor helps his friends who are having trouble based on the instructions of the teacher. The tutor acts as a leader in group activities as a teacher substitute. With this tutor is expected a closer relationship and familiar with classmates. Peer-to-peer tutoring is an enrichment and adds to learning motivation, and can also enhance a sense of responsibility and confidence.

Recent research shows that parents continue to have a significant influence, even during adolescence, a convincing discovery for many parents. It appears that peer group strength becomes more important when family relationships are not close or less supportive. For example, if parents work extra hard or work outside the main job and most relationships are not available, their children can turn to their peer group for emotional support. It also occurs when conflicts between parents and children at the age of teenagers or at any time during child development become so great that the child feels distant and seeks closeness with others or peers elsewhere.

The application of peer tutors can not be separated from the development of subjects or subjects in school. This application not only contains materials taught to learners but is related to methods, strategies, and learning models.

In materials with basic competencies that contain the achievement of practical competence, teachers can develop the ability of learners by using peer tutors.

E. Conclusions

Based on the results and discussion, it can be concluded that there are differences in learning outcomes mahapeserta students before and after done cooperative learning strategies peer tutor model.

F. Suggestions

1. For teachers, especially biology teachers cooperative learning model peer tutor model can be used as an alternative in biology learning to improve learning outcomes of learners.
2. For other researchers are expected to use cooperative learning strategy peer tutor model so that the learning process is more varied.