

## STUDENT TEAM ACHIEVEMENT DIVISION MODEL (STAD) IN INCREASING HUMAN DIGESTIVE SYSTEM LEARNING OUTCOMES

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**Abstract:** This study aims to implement the STAD learning model to improve student learning outcomes and student responses. The STAD model was applied to 29 Semen Gresik Junior High School students. The research design used was one group pretest-posttest design with data collection methods using a test, questionnaire, and observation methods. The research instruments were learning sheets, pretest questions, and student response questionnaire sheets. The study found an increase in learning outcomes through the calculation of N-Gain with an average value of 0.85 in the high category. Student responses in learning activities using the STAD method showed very positive results, with an average percentage of 92%. The application of the STAD learning method was very good at meetings I and II. Based on the research data analysis, it can be concluded that there is an increase in learning outcomes through the STAD type cooperative learning model in the material of the human digestive system.

**Keywords:** *STAD, Learning Outcomes, Human Digestive System*

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### INTRODUCTION

Cooperative or collaborative learning has improved social relationships, in contrast to traditional learning in ancient times [1]. The main idea of the Student Teams Achievement Division (STAD) is to encourage students to support each other and help in mastering the skills taught by teachers [2]. The purpose of the model is to help students become accustomed to learning to help each other in groups to solve problems and complete assigned tasks. In addition, the Student Teams Achievement Division (STAD) type cooperative model can also help students understand various learning concepts that are not easy and develop their collaborative skills, critical thinking, and social attitudes [1]. Group learning can solve learning problems, so it is necessary to obtain maximum learning results by the goals.

The STAD type cooperative model is a model that focuses on the implementation of good student communication and cooperation in a predetermined group to help achieve predetermined learning goals. Teachers who apply the model in learning will also discuss student group learning, presenting new learning issues to students, and text-based or oral presentations. Teachers carry out the division of groups by dividing students into groups which can consist of 4-5 people heterogeneously, both men and women from different tribes, with various levels of ability, namely low, medium, and high [3].

In teaching and learning relationships, there are various examples of learning that aim to achieve a learning process that runs well and is conducive. Referring to the regulations in Sisdiknas Law No. 20 Th 2003, education in Indonesia aims to train characters with sufficient quality and ability

to have a broad vision of the future to achieve the desired goals and adapt quickly and accurately to different environments. Therefore, education can encourage us to be better than before. Today, students must be human beings of character, and quality, have great minds, adapt well to the environment, and become better in all aspects through education.

The purpose of science learning in Junior High School is to increase confidence in the greatness of God Almighty, but not only that, but also to deepen our knowledge of natural signs, concepts, and principles of science that are useful in our daily lives. In addition, it can deepen scientific knowledge, concepts, and skills to the next level as the basis for further education [4].

The purpose of the science learning process is to actively focus on students' activeness, not on something done by educators who are still very dominant in using one-way explaining or communication methods so that they are less interested in learning. Since the three main structures of science education are not applied, namely behavior, scientific processes, and the use of products, education represents only a wide range of information and tends to be memorized. An example that feels perfect for overcoming the feud is to try to implement a model of learning activities, namely a cooperative model that is easy to run, namely the type of Student Teams Achievement Division (STAD) in the research conducted [2].

Learning outcomes are learners' experiences obtained after a student receives the learning. Learning outcomes are the level of proficiency that individuals or students gain after being involved in the learning process experience.

Learning outcomes are knowledge obtained by students that include various principles, namely psychomotor, cognitive, and affective realms [5].

Learning outcomes are students' cognitive competencies and are applied both in the surrounding environment and school. Not only that, but learning outcomes also have a role in measuring students' abilities and carrying out learning strategies used to get the desired results [6]. Teachers do their best to help students achieve the results of learning completion. Poor learning outcomes can be caused by several factors in the field, including external factors, namely environmental factors that will affect both physical and social learning outcomes. And instrumental factors include the curriculum, facilities in supporting learning, and teachers. Internal factors are physiological factors, generally a healthy state of health, no fatigue, no defects, etc. And psychological factors, each student has a different mindset, which will affect learning outcomes [5].

Based on the interviews by junior high school teachers of Semen Gresik regarding the learning outcomes of human digestive system materials, 75% of students have not met the standard minimum of completeness. Only 25% of students meet the minimum completion of  $\geq 75$  set by the school. It might happen due to the difficulties experienced by students in understanding the digestive system in humans. Teachers must find innovations in every teaching and learning activity so that students can understand the material and achieve the minimum completion criteria so that student learning outcomes improve. Based on the empirical studies, we conducted a study to understand more about the influence of the cooperative STAD model on student outcomes.

The cooperative learning model is that students are formed in groups of four to five to help each other complete the assigned task [7]. The cooperative learning model is learning that emphasizes teamwork and can provide tangible evidence in the learning process [8]. The STAD-type cooperative learning model can optimize student liveliness and student learning outcomes [9]. Cooperative learning is required for collaboration between students. There is heterogeneous group mapping where students will exchange ideas. Students who already understand the material can convey it to other students.

## RESEARCH METHODS

The type of research used in this study is a Pre-Experimental design experiment that only requires one class and the absence of classes that do not receive treatment. The current study uses a One Group pretest and posttest design to determine the role of cooperative models of student teams achievement division (STAD) types

on student learning outcomes. One-group pretest-posttest design is a research design conducted as presented [10].

$O_1$	$X$	$O_2$
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Where  $O_1$ : Pretest results before treatment;  $X$ : Treatment using a cooperative model of student teams achievement division type;  $O_2$  : Pretest results after treatment

The selected research subjects amounted to 29 students of class VIII-D, with 124 students consisting of 4 classes, namely class VIII-A, VIII-B, VIII-C, and VIII-D. Research sampling with subjects  $>100$  people, then taken entirely, while for subjects  $<100$  people or more can take 10% - 15% or 20% - 25% or more [11]. Offline, the study was conducted in the odd semester of the 2021/2022 school year from November 30, 2021, until December 7, 2021. Learning tools used in research include syllabuses, lesson plans with STAD-type cooperative learning models, and student worksheets. The reviewer also used several instruments to support the implementation of the research. It consists of an observation sheet on implementing the STAD-type cooperative learning model, pretest questions given before the learning process, posttests given before the learning process, and student response questionnaire sheets to find out the level of reaction. The data collection techniques used are questionnaires, tests, and observations.

Pretest and post-test questions are distributed to students totaling 10 items of multiple-choice questions with four answer options. Results of pretest and posttest are used as a benchmark for students to find out the improvement of learning outcome scores after using a cooperative model of type STAD. The improvement of learning outcomes can be reviewed from the acquisition of N-gain, the average result of pretest-posttest, and completeness.

Student response data is obtained from students' answers to statements from questionnaire sheets given by researchers, namely, for statements that have been submitted on the sheet have a score based on the Likert scale assessment.

Table 1. Scale Likert

Criteria	Score
Strongly Disagree	1
Disagree	2
Less Agree	3
Agree	4
Very Agree	5

Here is the formula of the results to be obtained:

$$\text{Score obtained} = T \times P$$

Information :

T = Total number of respondents who voted

P = Likert scale score number selection

To continue processing data on the questionnaire, student response results can be analyzed using the following formula:

$$\text{Percentage} = \frac{\text{score obtained}}{\text{maximum score}} \times 100\%$$

In obtaining the results of student, responses are seen based on criteria [12].

Table 2. Student Response Outcome Criteria

Criteria	Score
Very Positive	>84%
Positive	84% - 68%
Usual	68% - 52%
Negative	<52%

For the results of observation of learning implementation obtained from the assessment by one observer, namely with the help of science teachers at Semen Gresik Junior High School, where each statement contains the following criteria:

Table 3. Criteria for Observation results of Learning Implementation

Criteria	Score
Strongly Disagree	1
Disagree	2
Less Agree	3
Agree	4
Very Agree	5

After this is done, analysis using the calculation formula:

$$\text{Value} = \frac{\text{score obtained}}{\text{maximum score}} \times 100\%$$

The results of learning implementation can be seen through the following criteria.

Table 4. Learning Implementation Outcome Criteria

Criteria	Score
Excellent	≥75%
Good	<75%
Good Enough	<50%
Not Good	<25%

The increase in student learning outcomes after being given treatment is calculated through the average value of N-gain. The following data on student learning outcomes can be analyzed using the gain-score test as follows [13].

$$g = \frac{\%(sf) - \%(si)}{100 - \%(si)}$$

where g = normalized gain score;  $s_i$  = value pre-test;  $s_f$  = value post-test

Table 5. Normalized Gain Criteria

Percentage	Category
0.0<(g)≤0.3	Low
0.3<(g)≤0.7	Keep
0.7<(g)≤1	High

## RESULT AND DISCUSSION

The test results that have been given to students of class VIII-D semen Gresik Junior High School obtained data on the results of pretest and posttest can be seen

in Table 6.

Table 6 depicts that pretest students have an average score of 29.65 and a student posttest score of 89.31. The result is obtained from the average N-Gain of 0.85, which is a high category of N-Gain criteria. It can be interpreted that the results of the completion of learning of students in class VIII-D of the digestive system material in humans increase. Students' learning outcomes of class X MIA 2 at Senior High School 1 Singaraja increased after educators applied a cooperative model of student teams achievement division (STAD) type to students [14]. Experiments with the same learning model on physics lessons also improved physics learning outcomes in students of class X Vocational High School6 Palu [15]. Learning with the STAD method allows students to meet the minimum requirements for completing each lesson. The cooperative model with an easy-to-implement type, namely the type of student teams achievement division, can improve the results of learning completion to meet the minimum completeness score determined previously [16].

The success of the competency achievement indicator is displayed in Table 3.

Based on Table 7, there is an increase in competency indicators on indicators 1,2,3 and 4 with high categories and indicators 5 with medium categories. It means that the competency indicator has been achieved. It can allow students to have preliminary knowledge of digestive system materials in humans so that they can do pretest questions where they have not received material from the teacher. The posttest value on indicator 2 has a very high value of 96.55, and indicator 5 reaches a medium posttest value of 72.41. It is possible in the indicator of 2 students being able to work together with group mates to solve a problem related to diseases of the human digestive system. The STAD type based on cooperative learning is cooperative learning that

applies small groups in learning consisting of 4 to 5 students who vary. Within STAD, students are grouped into 4-5 members of a study group, mixed with achievement, gender, and ethnicity levels. While in indicator 5, students' grades are not completed may be due to students' lack of understanding of the function material of the organs of the human digestive system, the overall score gets a high

average. It can be stated that there is an increase in learning outcomes [7].

In addition, students' response results were obtained after participating in active learning with the cooperative model of the STAD method. The percentage of student responses can be displayed in Figure 2.

Table 7. Student Learning Outcomes Based on Indicators

No	Indicator	Pre-test	Post-test	N-Gain	Category
1.	Analyze various organs of the digestive system in humans and the digestive processes that occur in the body.	19.54	95.10	0.93	High
2.	Analyze information about a disease that has a relationship with the digestive system.	55.17	96.55	0.92	High
3.	Solving mechanical and chemical digestion.	20.68	90.55	0.88	High
4.	Analyze the function of enzymes in the digestive process of food.	30.98	91.95	0.88	High
5.	Analyze the function of the organs of the human digestive system.	21.89	72.41	0.64	Keep
Average		29.65	89,31	0,85	High

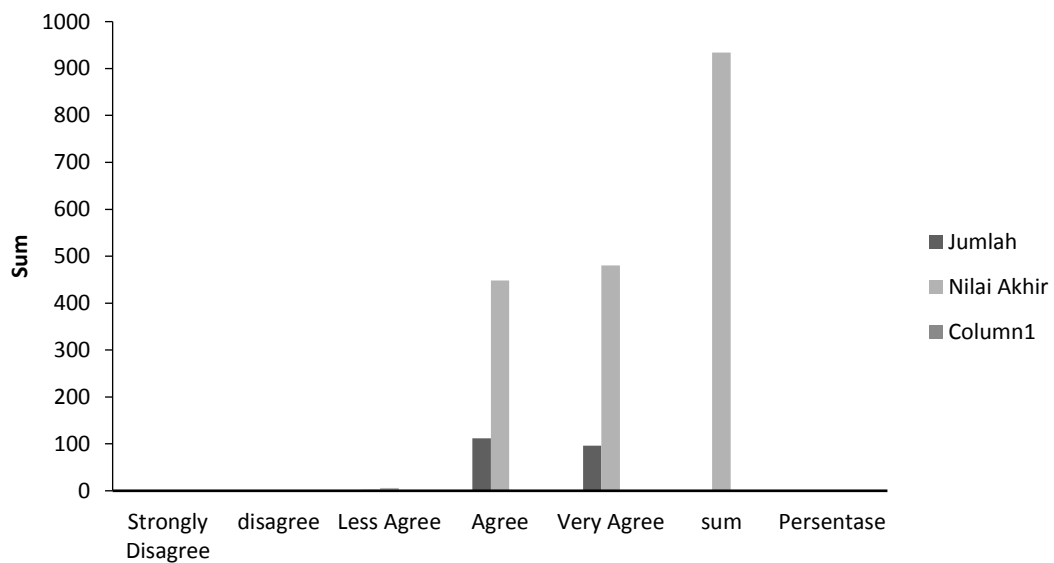
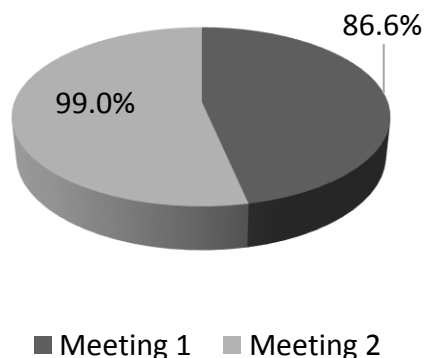


Figure 2. Student Questionnaire Results

Figure 2 shows that student responses obtained an average of 92%, which means that students' responses are very positive to STAD-type cooperative model activities. Students have high enthusiasm for motivating themselves to participate in cooperative modeling learning activities of the STAD model. The main idea of STAD is to motivate students to support each other and help each other in mastering the abilities that have been taught by teachers [2]. Students can master

appropriate steps in finding solutions to solve problems by applying their knowledge. The conventional learning model tends to begin with perception, presentation of information, and giving questions and tasks. It can be concluded that teacher-centered learning interaction is delivered by students less, and there are no cooperative groups [17]. Therefore, the stages in learning STAD have been followed by all students by the teacher's procedures.

Improved learning outcomes and positive student response will not be separated from the success of learning implementation. In addition to the learning methods used, the success of the learning process is also largely determined by the curiosity and interest of learning students [1]. Based on the results of observations made on the activities of teachers and students during the learning process by applying the STAD type cooperative model, obtained from the learning implementation value presented in the figure below:



■ Meeting 1 ■ Meeting 2

**Figure 3.** Learning Implementation

Figure 3 shows the percentage of implementation in the learning plan that has been carried out well. This can be reviewed from meeting I, observer I gave a learning performance value of 86.6% or 87% so that it can be categorized very well. At meeting II, observer II is as much as 99% so that it can be shouted as very good. Based on these existing results, it can be interpreted as the management of learning activities carried out by educators and student activities during learning activities is also very good. Learning outcomes are changes that occur due to learning activities that have been carried out by individuals [18].

There is an increase in good learning outcomes when implementing the STAD type cooperative model, which can be used as a benchmark for students against the indicator that the learning process is very effective because this model has teaching effectiveness in the form of tests. After all, the test results can be observed to evaluate various aspects of the teaching and learning process, which furthermore the results of learning completion achieved by students are very high [19]. Teachers can use STAD. It is also associated with student group learning and uses oral and textual presentations to convey information to students each week [20].

## CONCLUSION

Applying a cooperative model with the type of STAD material of the human digestive system, there is an increase in the results of learning completion. The results of the N-Gain with an average of 0.85 can be interpreted in the

high category. The percentage of the learning at the 1st and the 2nd meeting obtained a percentage of 86.6% and 99.1%, respectively. It is in the criteria of excellent learning. The results of the learner response sheet showed an average percentage of 92%, which illustrates that the model received a positive response that was applied to the criteria very well. Based on the study results, it is recommended that teachers explore the use of cooperative models of the STAD type during learning because the learning model is very effective in learning. The cooperative STAD model can be used during experiments outside the classroom to provide more research references in the development of student science competencies.

## REFERENCES

- [1] Biologi Model STAD Dan TGT Ditinjau Dari Keingintahuan Dan Minat Belajar Siswa. *Jurnal Pendidikan IPA Indonesia*, 2(1).
- [2] As, M. Y. (2021). Influence of STAD cooperative learning model to improving physics learning process and learning outcomes. *Jurnal Pijar Mipa*, 16(4), 519-524.
- [3] Kristin, F. (2016). Efektivitas Model Pembelajaran Kooperatif Tipe STAD ditinjau dari Hasil Belajar IPS Siswa Kelas 4 SD. *Jurnal Scholaria*, 6(2), 74-79.
- [4] Anindyarini, A. (2021). The Effect of Folktale-Based Comics on Traditional Ecological Knowledge Literacy about Non-rice Food Security. *International Journal of Instruction*, 14(3).
- [5] Oddone, K., Hughes, H., & Lupton, M. (2019). Teachers as connected professionals: A model to support professional learning through personal learning networks. *International Review of Research in Open and Distributed Learning*, 20(3).
- [6] Widayanti, E., & Slameto, S. (2016). Pengaruh Penerapan Metode Teams Games Tournament Berbantuan Permainan Dadu Terhadap Hasil Belajar IPA. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 6(3), 182-195.
- [7] Slavin, R. E. 2008. *Copperative Learning Teori, Riset dan Praktik*. Bandung: Nusa Media
- [8] Nurayani, N., Khairuddin, K., & Raksun, A. (2020). Perbedaan Hasil Belajar IPA (Biologi) Siswa Pada Penerapan Model Pembelajaran Kooperatif Tipe Team Games Tournament (TGT) dengan Tipe Numbered Head Together (NHT). *Jurnal Pijar Mipa*, 15(4), 346-350.
- [9] Rochmatin dan Ganes Gunansyah (2014). Penerapan Model Pembelajaran Kooperatif Tipe STAD Meningkatkan Hasil Belajar Siswa dalam Pembelajaran IPS Kelas IV. *Jurnal Pendidikan Guru Sekolah Dasar*, 2 (3), 1-8

- [10] Sugiyono. (2016). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: PT Alfabet.
- [11] Arikunto. (2010). *Prosedur penelitian suatu pendekatan praktek*. Rineka Cipta
- [12] Ningsyih, S., Hairunisa, H., Fatimah, N., & Ulfa, M. (2022). The effect of the team games tournament model with the traditional game media to train critical thinking ability in elementary school students. *Jurnal Pijar Mipa*, 17(1), 62-66.
- [13] Hake, R.R. 1998. Interactive engagement v.s traditional methods: six- thousand student survey of mechanics test data for introductory physics courses. *American Journal of Physics*. Vol. 66. No.1.
- [14] Casey, A., & Goodyear, V. A. (2015). Can cooperative learning achieve Muldayanti, N, D. (2013). Pembelajaran the four learning outcomes of physical education? A review of literature. *Quest*, 67(1), 56-72.
- [15] Sulisworo, D., & Suryani, F. (2014). The effect of cooperative learning, motivation and information technology literacy to achievement. *International Journal of Learning & Development*, 4(2), 58-64.
- [16] Utami, Santi. (2015). Peningkatan hasil belajar melalui pembelajaran kooperatif tipe stad pada pembelajaran dasar sinyal video. *Jurnal Pendidikan Teknologi Kejuruan*. 22(4): 424-431.
- [17] Suryosubroto. (2002). *Proses Belajar Mengajar Di Sekolah*. Jakarta: Rineka Cipta.
- [18] Tennant, M. (2019). *Psychology and adult learning: The role of theory in informing practice*. Routledge.
- [19] Cacciamani, S. (2017). Experiential learning and knowledge building in higher education: An application of the progressive design method. *Journal of e-Learning and Knowledge Society*, 13(1).
- [20] Yang, K. T., Wang, T. H., & Chiu, C. M. H. (2015). Study the effectiveness of technology-enhanced interactive teaching environment on student learning of junior high school biology. *Eurasia Journal of Mathematics, Science and Technology Education*, 11(2), 263-275.