

Improving the Science Learning Outcomes of Grade V Students of SDN Rawaapu 06 Patimuan through the STAD Learning Model Assisted by Google Form

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ABSTRACT

This classroom action research aims to improve the learning process and learning outcomes of Natural and Social Sciences (IPAS) subjects by implementing the Student Teams Achievement Division (STAD) cooperative learning model supported by Google Form for fifth grade students of SDN Rawaapu 06, Patimuan District, Cilacap Regency in the 2024/2025 Academic Year. Based on the results of observations, the low IPAS learning outcomes were caused by the lack of variation in the application of learning models that could activate students and limited innovation in assessment. This research was conducted in three cycles, each of which consisted of stages of planning, action implementation, observation, and reflection. The subjects of this study were 23 fifth grade students of SDN Rawaapu 06. Data were obtained through Google Form-based learning outcome tests, student activity observation sheets, and field notes. The results of the study showed an increase in the average value of students' social sciences, which was originally 40.86 in the pre-cycle, to 51.73 in cycle I, 70.43 in cycle II, and 81.30 in cycle III. The percentage of students' learning completion also increased, namely from 13.04% in the pre-cycle to 30.43% in cycle I, 65.22% in cycle II, and 91.30% in cycle III. The application of the STAD model assisted by Google Form has proven effective in improving students' social science learning outcomes, strengthening active involvement in group discussions, and providing direct feedback that accelerates the process of analyzing evaluation results, especially on ecosystem material. This study recommends the use of the STAD model assisted by digital technology as an innovative alternative in social science learning at the elementary school level.

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1. INTRODUCTION

Education at the elementary school level plays an important role in forming the foundation of students' knowledge and skills. The subject of Natural and Social Sciences (IPAS) is one of the crucial fields of study in the elementary school curriculum, because it integrates basic concepts of science and social sciences that are relevant to everyday life. However, in reality, students' learning outcomes in the IPAS subject are still often below

the expected standard. One of the contributing factors is the use of learning models that are less varied and do not actively involve students in the teaching and learning process.

Student Teams Achievement Division (STAD) cooperative learning model has been widely applied to improve student learning outcomes. STAD was developed by Robert Slavin at Johns Hopkins University in the 1970s. Slavin (1995) stated that STAD has five main components, namely class presentations, team learning, quizzes, individual score improvement, and team recognition ¹. This model emphasizes cooperation in small heterogeneous groups to achieve common learning goals ². In an international journal ³, it is mentioned about STAD grouping that "Students numbering four to five will be grouped into teams formed based on certain differences, such as ability level, gender, race, and other aspects. In this process, the teacher acts as a facilitator who provides direction through brief but clear instructions. Then, students will study the material that has been set in the Expert Group before rejoining the STAD group to exchange ideas. After discussing in the Expert Group, they will return to their respective STAD groups to compile a synthesis of information. At this stage, students are required to strengthen their peers' opinions, review their understanding, and compile a summary of the ideas that have been presented. Assessments are carried out to measure the level of students' understanding of the main points of the material through presentations, quizzes, and application of concepts. Their development will be assessed based on the accumulated scores obtained". STAD is a cooperative learning model that focuses on the achievement of student teams. Each student in their team or group is individually responsible for answering the quizzes given by the teacher. From these quizzes, students collect points in groups, where the group with the highest points gets an award (*reward*) from the teacher ⁴.

The results of Hazmiwati's (2018) study ⁵ showed that "The application of the STAD model can significantly improve the science learning outcomes of elementary school students, as indicated by the percentage of students' science learning outcomes in cycle I of 62%, then at the end of cycle II 88% of students achieved KKM". In another study by Evi A (2024) ⁶ in class VI of Sidosermo I/427 Surabaya Elementary School, the results were that: "The application of the STAD type cooperative learning approach has been proven to improve students' understanding of science material as evidenced by the increase in student learning outcomes, namely cycle I obtained an average of 46 with an absorption capacity of 46%, while cycle II obtained an average of 82 with an absorption capacity of 82%".

Science is a science that studies living things and inanimate objects in the universe and their interactions. Science also studies human life as individuals and as part of a society that interacts with its environment. Science learning needs to provide students with the opportunity to explore and investigate and develop an understanding of the environment around them ⁷. In science learning, there are two main elements, namely understanding science (science and social) and process skills ⁸. Therefore, a learning model is needed that facilitates active students and meaningful assessments to measure the achievement of learning objectives. According to Permendikbud No. 23 of 2016 concerning Education Assessment Standards, assessment is the process of collecting and processing information to measure the achievement of student learning outcomes ⁹. One of the instruments for assessing student knowledge is a test. When teachers create tests as a tool for measuring learning outcomes and correcting student answers, teachers need a lot of energy and time, especially in large classes. So it requires learning innovation to make assessments more effective and efficient.

As technology advances, the integration of digital tools in learning is becoming increasingly important. *Google Form* , as one of the digital tools that is easy to access and use, offers various features that can support the learning process that allows teachers to create quizzes and evaluations efficiently, as well as provide quick feedback to students ¹⁰. *Google Form* can help create open and closed questions. The answers can be in the form

¹ Sri Budiyo, 'Improving Student Learning Achievements through Application of the Student Teams Achievement Divisions (STAD) Method', *Journal of Applied Studies in Language* , 3.2 (2019), pp. 140–47 <<http://ojs.pnb.ac.id/index.php/JASLhttp://ojs.pnb.ac.id/index.php/JASL>>.

² Murthada Murthada and Seri Mughni Sulubara, 'Stad Type Cooperative Learning Model (Student Teams Achievement Division) at SMP IT Muhammadiyah Takengon', *Dewantara: Journal of Social Humanities Education* , 2.1 (2023), pp. 47–56, doi:10.30640/dewantara.v2i1.659.

³ Hastings Chim, 'Literature Review of the Cooperative Learning Strategy – Student Team Achievement Division (STAD)', *International Journal of Education* , 7.1 (2015), p. 29, doi:10.5296/ije.v7i1.6629.

⁴ Hazmiwati Hazmiwati, 'Implementation of Stad Type Cooperative Learning Model to Improve Science Learning Outcomes of Grade II Elementary School Students', *Primary: Journal of Elementary School Teacher Education* , 7.1 (2018), p. 178, doi:10.33578/jpkip.v7i1.5359.

⁵ Hazmiwati.

⁶ Evi Ariyanti Marlina Sihombing, Edi Surya, and Kms. Muhammad Amin Fauzi, 'Implementation of STAD Type Cooperative Learning Model to Improve Student Learning Outcomes', *Ability: Journal of Education and Social Analysis* , 8.4 (2024), pp. 17–22, doi:10.51178/jesa.v5i2.1950.

⁷ Ministry of Education and others, *Ministry of Education, Culture, Research, and Technology* , 2021, .

⁸ Education and others, .

⁹ Ministry of Education and Culture, 'Copy of Permendikbud Number 23 of 2016 Concerning Education Assessment Standards', 2016 , Education Assessment Standards, 2016, pp. 1–12 <<http://arxiv.org/abs/1011.1669v0Ahttp://dx.doi.org/10.1088/1751-8113/44/8/085201>>.

¹⁰ Selvi Sinta Wahyuni and Efrida Pima Sari Tambunan, 'The Effectiveness of Giving Quizzes Using the Google Form Application in Biology Learning on Student Learning Outcomes', *Jurnal Basicedu* , 6.5 (2022), pp. 8033–39, doi:10.31004/basicedu.v6i5.3599.

of *drop downs*, multiple choice, checklists, rating scales, and answer text boxes. Another advantage is that each question can be made mandatory so that nothing is missed by students. In addition, the contents can be numbers or text that can be limited by the number of characters, value ranges, or certain formats. In multiple choice questions, the answer choices can also be randomized¹¹.

The use of *Google Form* in learning has been proven effective in improving student learning outcomes, as shown in the research of Wahyuni and Tambunan (2022)¹² which found that "Giving quizzes using *Google Form* significantly improves student learning outcomes in biology learning". However, research examining the implementation of learning that applies the STAD model assisted by *Google Form* in science learning in elementary schools is still limited.

This study was conducted with the aim of implementing the STAD model supported by *Google Form* in science learning about ecosystems, and to evaluate the effectiveness of the model in improving the learning outcomes of fifth grade students of SDN Rawaapu 06. The combination of the STAD learning model with the use of *Google Form-based assessments* is expected to improve the quality of learning. This is because the method facilitates active collaboration between students and provides fast and accurate feedback, which has the potential to improve student learning outcomes in science subjects.

2. METHOD

This study uses the Classroom Action Research (CAR) approach. Arikunto, et al. (2006) stated that "Classroom action research is an activity of observing an object by following certain rules to obtain useful information, with the main objective of improving or enhancing the quality of learning practices"¹³. The CAR model used is Kemmis & Mc Taggart which consists of four components including; planning, action, observation and reflection¹⁴. This study was conducted in three cycles with success criteria of more than 75% of students being able to achieve the Learning Objectives Achievement Criteria (KKTP) for the Social Science score of Class V (five) SDN Rawaapu 06, which is 70.

The subjects of this study were 23 fifth grade students of SDN Rawaapu 06, Patimuan District, Academic Year 2024/2025 with details of the number of male students 11 people and female students 12 people. The STAD model is applied in each cycle through the following stages: presentation of material by the teacher, learning in teams, individual quizzes via *Google Form*, and team awards. The main material taught is "Ecosystem", with a focus on biotic, abiotic components, and relationships between living things. Data collection instruments are in the form of science learning outcome tests via *Google Form*, student activity observation sheets, and field notes.

3. RESULTS AND DISCUSSION

The implementation of classroom action research begins with planning by compiling a class V (Five) science teaching module on the main topic of ecosystems using the STAD learning model assisted by *Google Form* to create an evaluation instrument. With the learning objective: through group learning and conducting observations, students are able to identify ecosystem components, including the relationship between biotic and abiotic components correctly. In addition to compiling teaching modules, teachers prepare learning media, Student Worksheets (LKPD) and compile formative test questions assisted by *Google Form* with a total of 20 multiple choice questions. After the preparation is complete, the teacher carries out science learning with the STAD model. The outline of the steps for implementing learning in each cycle is contained in table 1 below.

Table 1. STAD model learning steps assisted by *Google Form*

Introduction
1) The teacher opens the lesson with a greeting and provides apperception, for example by asking students about their living environment and the living creatures around them.
2) The teacher conveys the learning objectives, namely understanding the components of the ecosystem and the interactions that occur within it.
3) The teacher briefly explains the learning activities using the STAD model that will be carried out.

¹¹ Adelia and others, 'The Role of Google Form as an Assessment Tool in ELT: A Critical Review of the Literature', *Indonesian Journal of Research and Educational Review*, 1.1 (2021), pp. 58–66 <<https://doi.org/10.51574/ijrer.v1i1.49>>.

¹² Wahyuni and Tambunan.

¹³ Dini Dwi Junistira, 'Implementation of STAD Type Cooperative Learning Model to Improve Learning Outcomes of Grade V Students in Social Studies Subjects', *JIIIP - Scientific Journal of Educational Sciences*, 5.2 (2022), pp. 533–40, doi:10.54371/jiip.v5i2.440.

¹⁴ G Sugiarta, 'Improving Physical Education and Health Learning Outcomes of Grade VI Elementary School Students with the Students Team Achievement Division Learning Model', *Journal of Education Action Research*, 6.3 (2022), pp. 315–20 <<https://ejournal.undiksha.ac.id/index.php/JEAR/article/view/51552>>.

Delivery of Material
1) The teacher gives questions as an initial test. 2) The teacher delivers material about ecosystems, ecosystem components (biotic and abiotic components), and the relationships between these components. 3) The teacher gives examples of ecosystems (e.g. forests, rice fields, rivers, and seas) and explains how each component interacts with each other. 4) The teacher invites students to make observations outside the classroom (the school environment) to help students understand the material better.
Formation of STAD Group
1) The teacher divides students into several heterogeneous groups consisting of 4-5 people. 2) Each group consists of students with diverse academic abilities (heterogeneous). Each group is given a name or number to facilitate identification.
Group Work for Material Understanding
1) The teacher distributes LKPD containing assignments related to ecosystem material. 2) Each group discusses the answers together. Each group member is expected to actively contribute and understand the agreed answers. 3) Students are asked to help each other and ensure that all group members understand the material well. Presentation of each group.
Individual Formative Assessment
1) After the group discussion is complete, the teacher gives individual tests to measure each student's understanding independently of the components of the ecosystem and interactions within the ecosystem. 2) The test questions are in the form of a <i>Google form link</i> that can be accessed using <i>the smartphone</i> brought by the student.
Scoring and Awards
1) Teachers monitor and take test scores based on students' answers in <i>Google Form</i>. 2) The individual scores of each group member are analyzed for improvement from the initial score. Then the improvements are added up and averaged to determine the total group score. 3) The teacher gives awards or praise to the group that gets the highest score to motivate other students to try better.
Closing:
1) The teacher provides feedback on the results of discussions and individual tests. 2) Make conclusions and reflect together. 3) The teacher gave appreciation to all students for their participation. 4) The teacher closes the lesson with greetings and prayers.

From the implementation of learning in each cycle, it produces individual student test scores on *Google Form*. Analysis of student test results for each cycle is as follows.

a. Cycle I

From the results of the formative test in cycle I, it can be seen that the average value of the IPAS material on ecosystems in class V of SDN Rawaapu 06 is 51.73. This result has increased, from the average value in the pre-cycle which was only 40.86. And out of 23 students, only 7 students obtained scores above the Learning Objective Completion Criteria (KKTP). A total of 16 students have not met the KKTP.

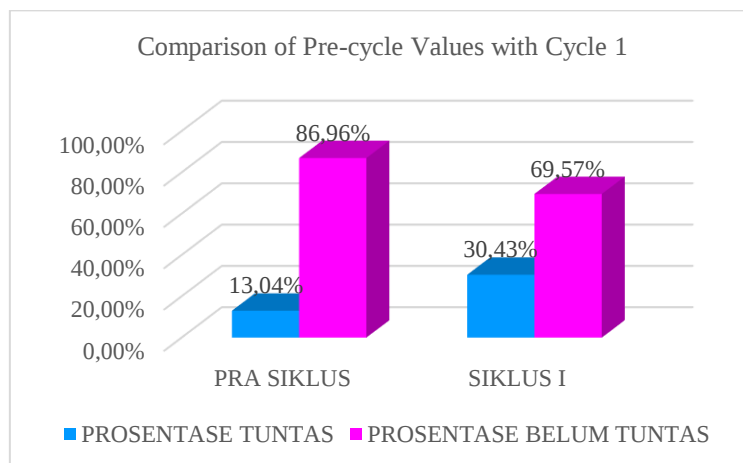


Figure 1. Comparison Pre-Cycle and Cycle I Science Learning Outcomes

Based on Figure 1 on Comparison of Pre-Cycle Values with Cycle I, it can be analyzed that at the Pre-Cycle stage, the level of student learning completion is still very low. Only 13.04% of students achieved the Learning Objective Achievement Criteria (KKTP), while 86.96% of students were declared incomplete. This condition shows that most students have difficulty in understanding the science and science material, especially on the topic of ecosystems, with the previous learning method.

After implementing the STAD type cooperative learning model with the help of *Google Form*, there was an increase in learning outcomes in Cycle I. The percentage of students who achieved completion increased to 30.43%, while the percentage who had not completed decreased to 69.57%.

This improvement shows that the use of the STAD method combined with *Google Form technology* has begun to have a positive impact on student learning outcomes. With more structured group work through STAD and the use of *Google Form* for practice questions and evaluations, students become more active in learning and are better trained in understanding the material. However, because learning completion has not reached more than 75% of the number of students (as the minimum standard for success in PTK), improvements and refinements need to be made to learning in the next cycle. Based on the results of observations during the learning process using the STAD model with the help of *Google Form* in Cycle I, it is known that the implementation of learning has not been optimal. This is indicated by the large number of students who have not met the KKTP. Some things that need to be improved include: improving the clarity of group assignment instructions, strengthening teacher assistance during team discussions, enriching the variety of practice questions on *Google Form* to better suit the level of student ability, and providing additional motivation and guidance for students who have difficulty understanding the IPS material, especially about ecosystems. This is a reflection material for teachers to improve learning in cycle II.

b. Cycle II

The teacher made a plan to improve the learning process in cycle II from the results of the reflection on the implementation of learning in cycle I. The things that were improved were: (1) providing a more detailed explanation of the material and work steps in the STAD model before students started discussing, (2) dividing groups more evenly based on academic ability so that there is mutual assistance in the team, (3) monitoring and guiding each group more actively during the discussion, (4) using *Google Form* with varying questions and gradual levels of difficulty to accommodate all student abilities.

At the end of learning in cycle II, the average class score was 70.43 with details of 23 students, 15 students had obtained scores above the KKTP in learning using the STAD model assisted by *Google form*. However, there are still 8 students who have not met the KKTP.

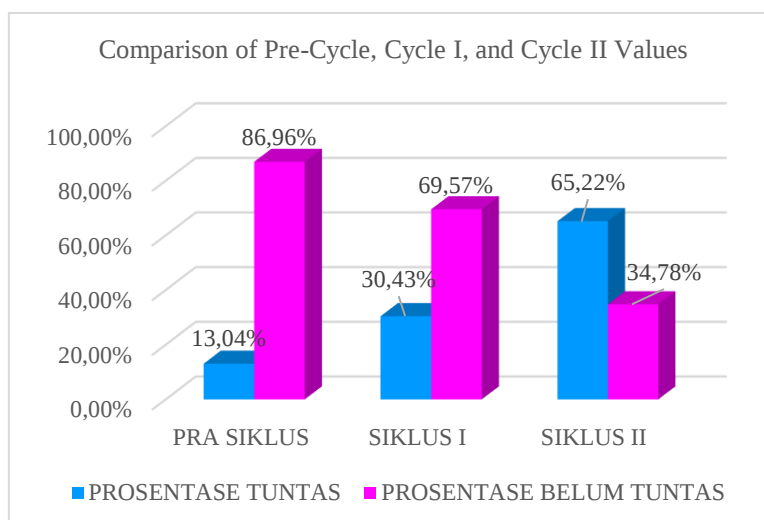


Figure 2. Comparison of Pre-Cycle, Cycle 1 and Cycle 2 Science Learning Outcomes

Based on Figure 2 on Comparison of Pre-Cycle, Cycle I, and Cycle II Values, it is known that in Cycle II there was an increase in the results of learning science on ecosystem material. Of the 23 students, 15 students (or 65.22%) have achieved KKTP completion. Meanwhile, 8 students (or 34.78%) have not yet achieved completion. This increase shows that the implementation of the Student Teams Achievement Division (STAD) learning model assisted by *Google Form* has succeeded in improving learning outcomes compared to the pre-cycle and cycle I.

Based on the learning outcomes in Cycle II, the use of the STAD model with the help of Google Form has been proven to provide significant improvements to student learning outcomes. They appear more active in group discussions and are more motivated thanks to the use of interesting digital media. However, there are still 34.78% of students who have not reached the level of completion. Analysis of the results of learning observations in cycle II found that the main factors influencing this incompleteness include lack of concentration during group discussions, weak mastery of basic materials, and challenges in using digital technology. This shows that although the learning approach has been more interesting, additional strategies are still needed to overcome individual student obstacles.

c. Cycle III

In the third cycle, the teacher took several steps for improvement, namely: (1) providing reinforcement of prerequisite material through a short *review* before the core learning, (2) managing group discussions more strictly by giving an active role to each group member, (3) providing technical assistance for students who still have difficulty using Google Forms, such as through simulations or short guides, and (4) providing stimulus or *ice breaking* to increase student concentration before starting the discussion, so that the learning atmosphere is more focused and effective.

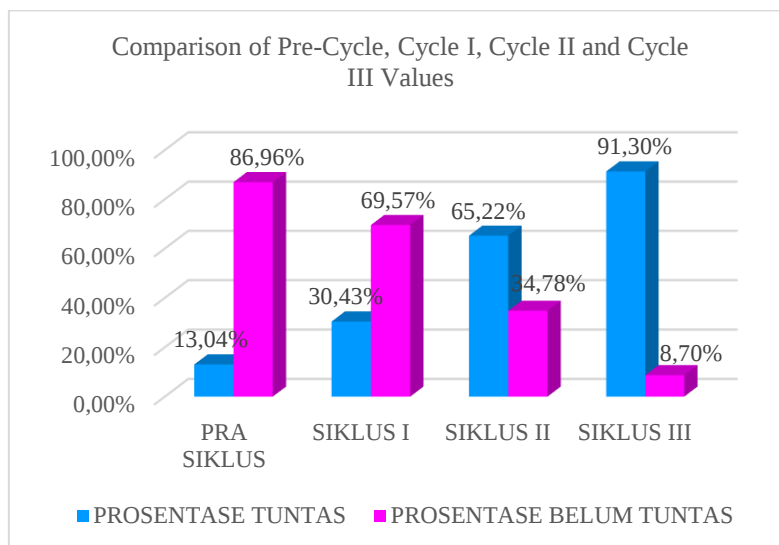


Figure 3. Comparison Pre-Cycle - Cycle III Science Learning Outcomes

Based on Figure 3, which is a comparison of the percentage of completion to the results of the cycle III test, it can be seen that out of 23 students, 21 students (91.3%) have obtained scores above the Learning Objective Achievement Criteria (KKTP), while only 2 students (8.7%) have not achieved completion. The average class score at the end of cycle III reached 81.30.

The increase indicates that the implementation of the STAD model supported by *Google Form* has proven effective in improving student learning outcomes. There is a significant tendency to increase from pre-cycle to cycle III, both in terms of average scores and the percentage of students who achieve completion.

Table 2. Comparison of Pre-Cycle, Cycle I, Cycle II, Cycle III Science Learning Outcomes

Stage	Average Value	Completion Percentage
Pre Cycle	40.86	13.04%
Cycle I	51.73	30.43%
Cycle II	70.43	65.22%
Cycle III	81.30	91.30%

These data show that the STAD type cooperative learning model combined with the use of *Google Form* not only improves students' science learning outcomes, but also increases students' active participation and learning motivation.

4. CONCLUSION

From the results of the classroom action research that has been carried out, it can be concluded that the application of the *Student Teams Achievement Division* (STAD) cooperative learning model supported by *Google Form* can improve the learning outcomes of science on the main material of ecosystems in grade V students of SDN Rawaapu 06 Patimuan. This increase can be seen from the increase in the average class score from pre-cycle to cycle III, as well as the level of student learning completion which reached 91.30% in cycle III. The use of the STAD model encourages collaboration between students, increases individual responsibility in learning, and strengthens understanding of concepts through group discussions. Meanwhile, *Google Form* simplifies the evaluation process and provides quick feedback to students.

The recommendation that can be given is that teachers can use the STAD learning model assisted by *Google Form* as an alternative in learning science and other subjects to improve student learning outcomes. In implementing the STAD model, however, it is necessary to pay attention to the formation of heterogeneous groups so that there is mutual assistance among students. Teachers are advised to provide reinforcement of basic materials and technical assistance, especially for students who have difficulty using technology. To achieve optimal results, teachers can combine this model with other active learning strategies that encourage student creativity and participation.

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