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The Efforts to improve cooperation and learning achievement in IPAS using TGT educandy at elementary school

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ABSTRACT

This Classroom Action Research (CAR) was conducted to address the low academic performance and collaborative skills of fourth-grade students at SDN 1 Sumbang in the subjects of Science and Social Studies (IPAS). The primary issues identified were low levels of social engagement, insufficient motivation for group work, and the results of the Mid-Semester Summative Assessment (ASTS 1), which indicated that 62.5% of students had not achieved the Minimum Mastery Criteria (KKTP). To overcome these challenges, a cooperative learning model, specifically the Teams Games Tournament (TGT) approach, was implemented. The study was conducted over two cycles, each comprising two instructional meetings. The findings demonstrated a notable improvement in student collaboration, with the average cooperation score increasing from 3.59 to 3.94. Furthermore, students' academic performance improved, with the average score rising from 71.25 (56.25% mastery) in the first cycle to 77.50 (84% mastery) in the second. These results suggest that the TGT model effectively enhances both collaborative skills and academic achievement in the topic "Forces Around Us."

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INTRODUCTION

A good curriculum is critical for a country to achieve its highest educational goals. Education is one of the most important things that can help a country achieve its goals. The Independent Curriculum has been implemented in Indonesia to improve learning in schools. (Tuerah & Tuerah, 2023). There are new subjects in the Merdeka Curriculum, namely P5 and science. Natural Sciences and Social Sciences have been combined into a single unit, Natural Sciences and Social Sciences (IPAS). It is estimated that integrating science and social studies courses will enhance multicultural education and foster a better understanding of the various cultures, histories, and socio-economic conditions in Indonesia and around the world (Suhelayanti et al., 2023).

To better understand the world and prepare for future challenges, students can learn about themselves and their surroundings, and apply this knowledge in their daily lives through science education. Science and PA have great opportunities to teach moral principles to students (Ramadhan et al., 2024). This is because the science and natural sciences curriculum is methodically designed to make learning dynamic, motivating, engaging, and challenging. In addition, this program provides children with ample space to develop mentally, creatively, and independently.

Collaboration is one of the life skills that can be developed in elementary school. Working together during the learning process is an important and integral component of other skills that students need to master. Improving group work and assessing the success of social bonds in society are two benefits of collaboration (Fauziyah et al., 2019). Student learning achievement shows how well

the learning process is going. Because learning is a process and learning success is the result of that process, learning activities and learning achievement cannot be separated (Permana et al., 2019). Educational media are a crucial component in the teaching and learning process. Educators generally use learning media to present material in a way that is easy for students to understand. Digital media education is one such medium. Educandy is one such medium. A learning experience that offers a fun, interactive way for students to learn through educational games.

Based on the researcher's observations, many fourth-grade students at SD Negeri 1 Sumbang still lacked social skills, as evidenced during group learning activities. Teachers did not reward groups that performed well, which made students reluctant to work in groups. Group learning is considered a burden for students. This causes students' social attitudes to remain low because they are unable to solve problems together, lack team cohesion, ignore each other's points of view, and are afraid to speak up. The researcher also interviewed several fourth-grade students to confirm the problem further. Students with exceptional talents and those with less were interviewed.

Based on the interviews, students with superior abilities expressed dissatisfaction when required to be in the same group as students with inferior abilities. Students with inferior abilities joined without thinking twice, so students with superior abilities objected to being in the same group as them. On the other hand, students with inferior abilities stated that they were unable to collaborate because they were embarrassed to be around friends with superior abilities, could not understand the subject matter, and lacked the confidence to express their opinions, fearing that their answers would be considered wrong. As a result, they prefer to remain silent. This affects student learning achievement, as grades are supposed to be based on group assignments, and only those who are capable achieve good results. The Mid-Semester Summative Assessment (ASTS 1) for IPAS in grade IV at SD Negeri 1 Sumbang in the odd semester shows that student learning achievement is still low.

Daily test scores for the fourth-grade science topic above. From this, we can see that there are 32 students in total. Not even half of them, or 68 students, achieved the KKTP. 12 students achieved the KKTP score, or 37.5%. Of the total number of students and learners who scored below the KKTP, 20 learners did so, representing 62.5%. This shows that the ASTS 1 scores for fourth-grade students in the Natural Sciences: Forces Around Us subject at SD Negeri 1 Sumbang are still well below the KKTP (Competency Standards).

To improve cooperation and learning outcomes in the Natural Sciences subject on Forces Around Us, the researcher and teachers decided to collaborate on an action

research project that would take these issues into account. The researcher and instructor chose the cooperative learning paradigm, Team Game Tournament (TGT), for the educational process. The TGT model is a cooperative learning strategy that utilizes academic competition, tests, and a personal assessment system, according to Slavin (2015:163). Students represent their teams in competition with other teams.

TGT is a simple way for groups to learn together through games and rewards, integrates all student actions regardless of their status, and uses students as peer tutors (Hasanah et al., 2020). Using the TGT learning model in the classroom makes students happy because they can play and compete with each other. This is especially true in elementary schools, where children are still at the stage of enjoying playing. This indicates that the learning method is highly effective in elementary schools (Adiputra & Heryadi, 2021).

Two key components of the TGT paradigm are student competition and group collaboration. Students will be more engaged in their learning if they collaborate in groups. By helping each other understand the material that will be used during the tournament, they collaborate to prepare themselves. For children to compete to win the game, there must be a competitive element. A game tournament involving students with similar or comparable learning outcomes is used to build this competition. Each student represents their team and competes to win the tournament.

Because cooperation is an important component of the learning process and helps students become more independent and responsible, the TGT cooperative learning model is applied. The TGT cooperative model was chosen because it aligns with students who enjoy playing and competing; in particular, its assessment system encourages students to participate more actively in their learning. This is believed to have the potential to increase collaboration and academic achievement in science subjects that cover the Gaya di Sekitar Kita (Style Around Us) curriculum in Grade IV at SD Negeri 1 Sumbang.

METHOD

This study used the four steps of Kemmis and McTaggart's Classroom Action Research (CAR) method: planning, action, observation, and reflection. Thirty-two fourth-grade students were the subjects of the study, which was conducted at SD Negeri 1 Sumbang in Banyumas Regency between January and March 2025. There were two rounds of research, each consisting of two meetings. This study used the *Teams Games Tournament* (TGT) cooperative learning model to help students work better together and achieve better results in science. Tests, observations, questionnaires, interviews, and documentation were used to collect data. Observations and questionnaires were used to evaluate student cooperation and teaching and learning activities, while tests were used to assess what students had learned. The average and percentage of learning completion were used in both qualitative and quantitative data analysis. The success of the action was marked by an increase in student cooperation to at least the "good" category, and 80% of students achieved the IPAS Learning Completion Criteria (KKTP) ≥ 68.

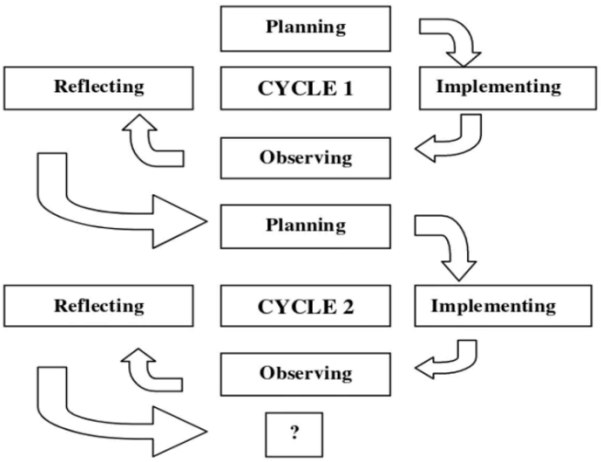

Figure 1. Kemmis & Taggart Classroom Action Research Model Research

RESULTS AND DISCUSSION

Through the *Teams Games Tournament* (TGT) cooperative learning approach, this classroom action research aimed to improve students' cooperation and learning achievement in the subject of Natural Sciences on Forces Around Us at SD Negeri 1 Sumbang. This research was conducted in two rounds, with two meetings in each cycle.

1. Cycle I

a. Planning

Action planning in cycle I involves several important steps that are systematically arranged to support the success of the learning process. The first step is to prepare the Learning Flow and Objectives (ATP) for the first and second meetings, in accordance with the material to be taught. Next, the teacher prepares Student Worksheets (LKPD) for both meetings as a guide for student learning activities. To support an engaging and interactive learning process, the teacher also prepares various learning tools and media, including educational game applications such as Educandy and question cards for class activities.

In addition to learning tools, the teacher also prepares assessment and observation instruments to evaluate learning outcomes. Teachers and students fill out activity observation sheets to track their participation throughout the learning process. In addition, evaluation sheets are prepared as benchmarks to assess student learning achievements after the learning process. Last but not least, a cooperation questionnaire is prepared to assess the extent of collaboration among students during the learning process. Finally, teachers also prepare documentation tools to comprehensively record the implementation of actions, as material for reflection and evaluation in the next cycle stage.

b. Action/Implementation

There are two sessions for planning the implementation of Cycle I

Meeting I

At the first meeting, learning was conducted in class IV at SD Negeri 1 Sumbang using the IPAS material "The Effect of Force on Objects". The activity began with the teacher's opening remarks, a prayer together, attendance, and initial motivation for the students. In the main activity, the teacher delivered the material using PPT media and *Educandy* educational games. Students were allowed to play games individually, with teachers accompanying them. Next, they were divided into four heterogeneous groups to work on LKPD, followed by a presentation of the group discussion results.

Then, a three-round *Game Tournament* was held, in which each group sent representatives in turns to answer questions using a scoring system. At the end of the activity, the teacher gave awards to Team C (Very Good) and Teams B and D (Good), and the students completed an evaluation. The evaluation results showed an average score of 71.56 with a learning completeness of 71.88%.

Meeting II

The second meeting began with an opening greeting, a group prayer, and a roll call. The teacher reviewed the previous material using *Educandy* to better prepare the students for further learning. The main activity began with a follow-up PPT presentation and a question-and-answer session to reinforce understanding. Then the students played the *Game Tournament* again, consisting of three rounds, with a rotation system for group members to answer questions and earn points. The students remained enthusiastic throughout the competition. Final recognition was given to Team D (Excellent) and Teams B and C (Good). An evaluation was conducted after the game ended, and the teacher summarized the material and closed the lesson. The evaluation results showed an average score of 70 with a completion rate of 65.63%.

c. Observation/Monitoring

Teacher Activities

Based on observations from cycle I, the instructor was more active between the first and second meetings. In the first meeting, the average score for instructor activity was 3.46, while in the second meeting, it increased to 3.50. In cycle I, the average score was 3.47, which is considered good. This shows how effectively the teacher applied the TGT learning methodology

Table 1. Results of Teacher Activity Observations in Cycle I

No	Aspects observed	Score		Total	Cycle I Average
		P1	P2		
1	Preparation (overall)	3	3	6	3
2	Initial Activities	15	16	31	15.5
3	Core Activities	46	46	92	46
4	Final Activity	14	14	28	14
5	Time Management	2	3	5	2.5
6	Questioning Techniques	3	2	5	2.5
Number per meeting		83	84	167	83.5
Average per meeting		3.46	3.50		

Student Activities

Observers evaluated student activities in Cycle I, and the average score was 2.64, which is classified as Good. Students were enthusiastic about science activities, actively involved in learning, and able to complete their homework and play games. However, some students still did not pay close attention or take notes correctly.

Table 2 Results of Student Activity Observations in Cycle I

Student activity indicators	Number of scores per meeting		Number	Average	Average per indicator
	1	2			
Indicator A	79	90	169	84.5	2.64
Indicator B	75	84	159	79.5	2.48
Indicator C	83	87	170	85	2.65
Indicator D	80	86	166	83	2.59
Indicator E	90	93	183	91.5	2.85
F indicator	95	75	170	85	2.65
Total Score	502	515	1,017	508.5	15.86

Cooperation Questionnaire

With an average score of 3.59, the questionnaire results indicate that student cooperation during learning was **rated Good.** Ten, sixteen, and six of the thirty-two students were categorized as fair, reasonable, and very good. This shows that most students worked well in groups.

Table 3. Results of the Student Cooperation Questionnaire Cycle I

No	Statement	Number	Average
1	I hang out with my group of friends even though they are not my close friends	103	3.21
2	I helped my friends who had difficulty understanding the material.	105	3.28
3	I gave my group members assignments to complete.	104	3.25
4	I oppose opinions that disagree with mine in discussions.	103	3.21
5	I am serious about participating in the tournament to win.	124	3.87
6	I participated in presenting the results of the discussion together with my group	127	3.96
7	When discussing, I prefer to discuss with friends who are close to me.	128	4.0
8	In the tournament, I am waiting for my turn to play	123	3.84
9	I joined my group and asked about the material I didn't understand	120	3.75
10	I put my work aside and waited for a friend who could help me.	116	3.62
Total		1,153	35.99
Average		115.3	3.59
Cooperation Criteria		Good	

IPAS Learning Achievement

In cycle I, student learning success was poor, with an average score of 71.25 and a completion rate of 56.25%. Of the 32 students, 18 completed the course, while 14 did not achieve the Minimum Passing Criteria (KKM) of 68 points. These results will help us make changes in the next cycle to improve the overall completion rate.

Table 4. Learning Achievement Results of Students in Cycle I

Indicator	Description
Number of students	32
KKM	68
Class completion rate	80
Number of students who completed Cycle I	18
Number of students who did not complete Cycle I	14
Total value of cycle I	2,280
Average value of cycle I	71.25
Percentage of Cycle I completion	56.25
Criteria for Cycle I completion rate	Insufficient

d. Reflection

At the end of Cycle I, reflection indicated that the use of the TGT cooperative model for teaching aligned with the Teaching Module. However, because this was the first experience for the fourth-grade students of SD Negeri 1 Sumbang, the results were still not optimal. The learning completion rate was only 56.25%, which did not meet the classical completion target of 80%, so it could not be considered successful.

In general, teacher observations received an average score of 3.47 (good), student activity observations received an average score of 2.68 (good), and the cooperation questionnaire showed that most children were in the "good" or "outstanding" category. However, some students were still in the "fair" category.

Things that need to be improved for the next cycle are

1. Students' understanding of the material is still lacking, especially when answering questions in the tournament. Teachers need to give students time and space to ask questions and understand the material more deeply.
2. Discipline during group work is still weak, with some students not taking the LKPD seriously. Teachers need to be more active in guiding and monitoring the LKPD process to ensure optimal cooperation.

Intensive support is needed for students with low scores to improve their learning outcomes in the next cycle.

Cycle II

a. Planning

Action planning in Cycle II is systematically organized to improve learning effectiveness and address shortcomings from the previous cycle. The planning stage begins with preparing the Learning Flow and Objectives (LFO) for the first and second meetings, which are modified according to the topics to be taught. Next, teachers prepare LKPD as material for exercises and group discussions in the learning process. To support the delivery of material, teachers also prepare learning tools and media, such as the Educandy game application and question cards, for tournament activities.

We also created observation sheets for teachers and students to monitor and assess the learning process. In addition, teachers compiled evaluation sheets used to assess student learning achievements after the learning process. As a supplement, a cooperation questionnaire was prepared to assess students' collaborative abilities in groups. Finally, teachers prepared documentation tools to record all actions taken during cycle II as material for further reflection and analysis.

b. Actions/Implementation

The implementation of Cycle II was divided into two meetings, namely:

Meeting I

The first meeting in cycle II was held in class IV at SD Negeri 1 Sumbang, using the material "Magnets: A Magical Object". The activity began with greetings, a prayer together, attendance, motivation, and the presentation of learning objectives. In the main activity, students conducted direct observations of concrete objects such as thrust, friction, gravity, and magnetic force. Several groups presented the results of the observations. The teacher also gave students story problems to solve together. Next, the students worked on the LKPD in groups, with tasks divided among the members. After the discussion, the results were presented.

During the *game tournament* session, students were divided into heterogeneous groups representing their respective teams to answer questions in turns in three rounds of play. Scores were recorded and calculated to determine the best team. Team C received a rating of "Very Good," while Teams A and D received a rating of "Good." The activity ended with an evaluation and summary of the material. The average score was 67.19, and 56.25% of participants completed the test, showing improvement but not yet reaching the classical target.

Meeting II

In the second meeting, the learning still focused on the same material, with a similar activity structure. The lesson began with greetings, prayers, attendance, a review of the previous material, and the presentation of learning objectives. In the main activity, the students again observed various types of forces through simple experiments. The results of the observations were presented in group presentations. The teacher reinforced the material through questions and answers, clarifying any concepts that were not yet correct. Students then worked on story problems and worksheets in groups with task divisions that encouraged collaboration. Subsequently, the tournament is held again in three rounds with the same rotation system and scoring as before. The students showed high enthusiasm and sportsmanship. Team A received a "Very Good" rating, while Teams B and C received a "Good" rating. The evaluation at the end of the activity yielded an average score **of 72.19** and a mastery level **of 81.25%**, indicating that the classical mastery target has been achieved.

c. Observation/Monitoring

Teacher Activities

Teacher observations during Cycle II indicated that their performance was better than in the previous cycle. The average score for instructor activities increased from 3.83 in the first meeting to 4.04 in the second meeting. The average score in Cycle II was 3.93, an excellent overall score. This shows that the teachers did an excellent job in implementing the learning process and were better at managing teaching and learning activities using the TGT cooperative learning approach.

Table 5. Results of Teacher Activity Observations in Cycle II

No	Aspects observed	Score		Total	Cycle I Average
		P1	P2		
1	Preparation (overall)	4	4	8	4
2	Initial Activities	18	18	36	18
3	Core Activities	48	52	100	50
4	Final Activity	16	17	33	16.5
5	Time Management	3	3	6	3
6	Questioning Techniques	3	3	6	3
Number per meeting		92	97	189	94.5
Average per meeting		3.83	4.04		
Average Cycle I = (94.5 ÷ 24) = 3.93					

Student Activity

Although there were still slight differences among indicators, students became more involved in the learning process.

Table 6. Results of Student Activity Observations Cycle II

Student activity indicators	Number of scores per meeting		Total	Average	Average per indicator
	1	2			
Indicator A	84	87	171	85.5	2.67
Indicator B	80	85	165	82.5	2.57
Indicator C	83	80	163	81.5	2.54
Indicator D	92	93	185	92.5	2.89
Indicator E	88	89	177	88.5	2.76
F indicator	79	91	170	85	2.65
Total Score	**506**	**525**	**1,031**	**515.5**	**16.08**
Average Cycle I = (16.08 ÷ 6) = 2.68					
Criteria = Good					

Observations of student activity showed positive results. The average student activity in learning reached 2.68, which is considered good. Students were active in group discussions, orderly when playing tournament games, and able to complete tasks with good cooperation.

Student Cooperation Questionnaire

The results of the cooperation questionnaire show that most children are quite helpful to one another. The average questionnaire score was 3.94, which is considered good, with 29 out of 32 students falling into the good and excellent categories. Only three students were still in the fair category. This shows that a cooperative atmosphere has been established within the group and is contributing positively to learning.

Table 7. Results of the Student Cooperation Questionnaire Cycle II

No	Statement	Number	Average
1	I hang out with my groupmates even though they are not my close friends	117	3.65
2	I help friends who have difficulty understanding the subject matter.	121	3.78
3	I assign tasks to my groupmates to complete	126	3.93
4	I oppose opinions that differ from mine in discussions.	130	4.06
5	I am serious about participating in the tournament to win.	125	3.90
6	I participated in presenting the results of the discussion together with my group.	127	3.96
7	When discussing, I prefer to discuss with friends who are close to me.	127	3.96
8	In a tournament, I wait for my turn to play.	135	4.21
9	I joined my group and asked about the material I did not understand.	123	3.84
10	I put my work aside and waited for a friend who could help me.	132	4.12
Total		1,263	39.41
Average		126.3	3.94
Cooperation criteria		Good	

IPAS Learning Achievement

In cycle II, student learning achievement increased rapidly. The graduation rate reached 84%, and the average score was 77.50, thus meeting the criteria for very good. Of the 32 students, 27 were declared complete, and only five were incomplete. This achievement shows that the TGT approach has improved science learning outcomes and that the markers of learning success have been met.

Table 8. Learning Achievement Results of Students in Cycle II

No	Indicator	Description
1	Number of students	32
2	KKM	68
3	Class completion rate	80
4	Number of students who completed Cycle II	27
5	Number of students who did not complete cycle II	5
6	Number of Cycle II scores	2,480
7	Average Cycle II Score	77.50
8	Percentage of Cycle II completion	84
9	Criteria for Cycle II completion	Very Good

d. Reflection

Reflection on cycle II shows that the learning process has been carried out in accordance with the designed Teaching Module. Students understand the material better and no longer have difficulty participating in *the tournament game*. Their enthusiasm also increased during the activity. The average scores for teacher activities and student activities were 3.93 and 2.64, respectively, both considered good. Based on the cooperation questionnaire, 29 students were categorized as good and very good. With a completion rate of 84.39% and an average of 78.59, the learning evaluation results fell

within the excellent range. Based on these results, the TGT cooperative model for science education was successful, as it met the previously set objectives.

Discussion

To improve the cooperation and learning achievement of fourth-grade science students at SD Negeri 1 Sumbang, this classroom action research was conducted in two cycles using the TGT cooperative learning paradigm. Learning was conducted twice per cycle, and the results showed positive outcomes.

Improvement in Student Cooperation

There was a significant increase in student cooperation. Some students were still not very cooperative in cycle I. However, after implementing the TGT model, they began actively cooperating, discussing, and helping one another in heterogeneous groups. Based on the cooperation questionnaire, the number of students in the excellent category increased from 6 to 8, the good category from 16 to 21, and the fair category decreased from 10 to 3. This shows that the TGT model successfully fostered social and collaborative interactions among students, primarily through activities such as LKPD discussions and tournament preparation.

The improvement in cooperation is also in line with the increase in student activity. The average observation score for student activity increased from 2.64 in cycle I to 2.77 in cycle II, both of which are in the good category, indicating increased student participation and involvement in the learning process.

Improvement in Student Learning Achievement

There was also a significant improvement in student learning abilities. The average score in cycle I was 71.25, and the pass rate was 56.25%. The average score increased to 77.50 in cycle II, and the pass rate increased to 84%. Of the 32 students, the number who completed the program increased from 18 to 27. This improvement was supported by a fun learning atmosphere through game tournaments and digital media such as Educandy, which made students more enthusiastic about understanding the concept (Maryani, 2024).

The TGT model, which combines elements of games and competition, helps students remember the material better (Astuti et al., 2022; Nela Avrilia Salsabila et al., 2024; Wibowo, 2024). The team tournament scores also reflect the students' active involvement. Teams that initially had low scores showed improvement in the next tournament, reflecting a more effective and adaptive learning process (Hasanah & Izzah, 2023).

Teacher activity also increased. The average teacher observation score increased from 2.62 in cycle I to 3.00 in cycle II, both of which are classified as good, indicating that teachers successfully improved the quality of learning implementation over time. Based on improvements in cooperation, student activity, learning achievement, and teacher performance across the two cycles, it can be concluded that fourth-grade students at SD Negeri 1 Sumbang improved their collaboration and learning achievement through the use of TGT cooperative learning on the topic of force. Therefore, the learning activity was deemed successful and did not need to be repeated in the next cycle.

CONCLUSION

Based on the results of a two-cycle classroom action research in grade IV at SD Negeri 1 Sumbang, the Team Game Tournament (TGT) cooperative learning model can help students work together more effectively and learn more about science topics, such as forces around us. The average score for student cooperation increased from 3.59 (good) in cycle I to 3.94 (good) in cycle II. The average score in cycle I was 71.25, with 56.25%

of assignments completed. In cycle II, the average score increased to 77.50, with 84% of assignments completed. Thus, the steps taken have met the success indicators.

The TGT model should continue to be applied and developed by teachers in IPAS and other subjects because it has been proven to improve student cooperation and learning outcomes. Teachers are also advised to continue modifying learning media, such as educational games, so that students are more likely to be active and think critically about what they are learning, and the learning environment is more enjoyable.

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