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The Effects of Team Games Tournament (TGT) Cooperative Learning on Collaborative Skills and IPAS' Learning Outcomes of Elementary School Students

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Abstract
This study aims to determine the effect of TGT Cooperative learning on cooperation skills and IPAS learning outcomes of sixth-grade students of Muhammadiyah Bangkalan Elementary School. This study is a quasi-experimental quantitative study with a pretest-posttest control group design approach. The location of the study was carried out at Muhammadiyah Bangkalan Elementary School, with research subjects being sixth-grade students divided into two groups, namely the experimental class that implemented TGT Cooperative and the control class that implemented conventional learning. Data collection techniques used learning outcome tests and observations of cooperation skills. The data analysis technique used was an independent sample t-test to test the differences in results between the experimental and control groups. The results showed that TGT Cooperative learning had a significant effect on improving students' cooperation skills and science learning outcomes. The results of the t-test showed a significance value of 0.000 <0.05, which indicated a significant difference between the control and experimental groups.

Keywords: Learning Outcomes; Cooperation; Cooperative Learning; Team Games Tournament; Science

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Abstrak
Penelitian ini bertujuan untuk mengetahui pengaruh pembelajaran Kooperatif TGT terhadap keterampilan kerja sama dan hasil belajar IPAS siswa kelas VI SD Muhammadiyah Bangkalan. Penelitian ini merupakan penelitian kuantitatif *quasi eksperimen* dengan pendekatan *pretest-posttest control group design*. Lokasi penelitian dilaksanakan di SD Muhammadiyah Bangkalan, dengan subjek penelitian adalah siswa kelas VI yang terbagi dalam dua kelompok, yaitu kelas eksperimen yang menerapkan Kooperatif TGT dan kelas kontrol yang menerapkan pembelajaran konvensional. Teknik pengumpulan data menggunakan tes hasil belajar dan observasi keterampilan kerja sama. Teknik analisis data yang digunakan adalah *independent sample t-test* ntuk menguji perbedaan hasil antara kelompok eksperimen dan kontrol. Hasil penelitian menunjukkan bahwa pembelajaran Kooperatif TGT berpengaruh signifikan terhadap peningkatan keterampilan kerja sama dan hasil belajar IPAS siswa. Hasil uji t-test menunjukkan nilai signifikansi 0.000 < 0.05, yang menunjukkan adanya perbedaan signifikan antara kelompok kontrol dan eksperimen.

Kata Kunci: Hasil Belajar; Kerja Sama; Pembelajaran Kooperatif; Team Games Tournament; IPAS

INTRODUCTION

Education plays a crucial role in shaping a generation that excels not only in cognitive abilities but also in the skills required to address twenty-first-century challenges, including critical thinking, collaboration, and communication. However, issues within these domains indicate that educational practices in schools still predominantly emphasize conventional methods, such as lecturing and memorization, which fail to encourage active student participation. As a result, many students struggle to understand subject materials, demonstrate limited critical thinking abilities, and exhibit inadequate social skills, particularly in collaboration and communication (Arends, 2012).

Education also plays a strategic role in developing high-quality human resources, strengthening character formation, and enhancing competitiveness in the global landscape. Ideally, the learning process in the classroom should facilitate not only the transmission of knowledge but also the development of social skills, including collaboration, communication, and problem-solving abilities. According to Christina Ismaniati (2013), many schools continue to be dominated by teacher-centered conventional learning approaches. Such instructional methods tend to position students as passive learners and often create boredom, resulting in less optimal learning outcomes (Arends, 2012).

Data from school examinations and local surveys indicate that average scores in several subjects, such as mathematics and science, remain below the minimum competency standards in a number of Indonesian junior high schools (Kemendikbud, 2020). Furthermore, classroom observations reveal that only a small proportion of students actively participate in questioning or discussion activities, while the majority remain passive. This condition is also reflected in students' limited ability to collaborate during group assignments, indicating insufficient social skills development (Slavin, 2015).

Observations conducted at SD Muhammadiyah Bangkalan revealed that sixth-grade students still experienced difficulties in comprehensively understanding natural and social science concepts. Learning assessment results showed that the average student achievement scores were below the standards established by the school. In addition, classroom observations during learning activities demonstrated limited interaction among students while completing group assignments. This condition reflects weak collaborative abilities, which are essential for future academic success.

In Integrated Science and Social Studies (IPAS) learning at SD Muhammadiyah Bangkalan, students frequently encounter difficulties in connecting theoretical concepts with practical applications in real-life contexts. Textbook-oriented and memorization-based instructional methods often fail to involve practical exploration, causing abstract concepts to become difficult for students to comprehend. Students' motivation and interest in the subject also tend to be low due to less interactive learning methods. Learning activities that are monotonous or solely oriented toward multiple-choice evaluations often prevent students from actively engaging in the learning process.

Cooperative learning represents a relevant alternative for improving the quality of instruction in response to these challenges. Cooperative learning prioritizes students as the center of the learning process by encouraging collaboration within small groups to enhance both social skills and academic achievement (Slavin, 2015). One engaging type of cooperative learning is the Team Games Tournament (TGT) model. To create an enjoyable and interactive learning environment, this model combines academic quiz-based tournaments involving competition among teams with collaborative learning activities (Kagan, 2009).

Cooperative learning offers a solution to these issues, particularly through the Team Games Tournament (TGT) approach. In this model, students collaborate within diverse teams

to prepare for academic tournaments designed by the instructor. The TGT model provides students with opportunities to develop collaborative skills, increase learning motivation, and participate in healthy academic competition (Kagan, 2009).

Accordingly, there remains a research gap regarding the limited studies integrating the effects of TGT cooperative learning on both collaborative skills and learning outcomes simultaneously, particularly within specific educational contexts and student characteristics. Therefore, this study was conducted to address this gap by comprehensively examining how the implementation of the TGT cooperative learning model affects not only academic achievement but also the development of students' collaborative skills during the learning process.

A review of previous studies indicates that most research on TGT cooperative learning has primarily focused on its influence on students' cognitive learning outcomes, particularly in science, mathematics, and physics subjects using quantitative, quasi-experimental, and classroom action research approaches (Dwiyanti et al., 2024; Safitri, 2019; Faturrahman, 2023). Several studies have also demonstrated that TGT cooperative learning significantly improves learning outcomes compared to conventional instructional methods, both through control-group designs and one-group pretest–posttest designs (Wijaya, 2012; Adiputra & Heryadi, 2021).

On the other hand, studies specifically emphasizing students' collaborative skills through the implementation of TGT cooperative learning remain relatively limited and generally employ classroom action research approaches focusing on the gradual improvement of social aspects across learning cycles (Sari et al., 2023; Muaziz et al., 2023; Syarafina, 2019). Although these studies reported significant improvements in collaborative skills, they have not extensively examined the relationship between collaborative skill enhancement and students' learning outcomes simultaneously within an integrated analytical framework.

This study contributes to the development of the literature on TGT cooperative learning by presenting several novelties: (1) the simultaneous integration of collaborative skills and Integrated Science and Social Studies (IPAS) learning outcomes within a measurable experimental design, (2) a unique context involving elementary school students in the coastal region of Madura at SD Muhammadiyah Bangkalan, which has not previously been investigated, and (3) the use of specifically developed instruments to measure both variables simultaneously rather than focusing solely on academic achievement. Therefore, this study not only replicates previous findings but also expands the scope of TGT cooperative learning effects on both social and cognitive aspects in an integrated manner.

Collaborative experimental learning has been shown to be more effective in improving students' science process skills compared to conventional instructional methods. Students who work in small groups are better able to understand the relationship between theoretical concepts and their practical applications (Roth & Roychoudhury, 1993). Furthermore, TGT cooperative learning has been proven to enhance students' conceptual understanding. Students within learning groups collaboratively master the material before participating in games or quizzes, thereby strengthening their comprehension of the learning content in both science and social studies subjects (Sugiyanto et al., 2020). Based on the background described above, this study aims to examine the effect of TGT cooperative learning on collaborative skills and Integrated Science and Social Studies (IPAS) learning outcomes among sixth-grade students at SD Muhammadiyah Bangkalan.

RESEARCH METHOD

This study employed a quantitative approach using a quasi-experimental design to examine the effect of the Team Games Tournament (TGT) cooperative learning model compared to conventional learning methods in improving students' collaborative skills and

learning outcomes. The research design applied was a non-equivalent control group design, in which both the experimental group and the control group were administered pretests and posttests to measure changes before and after the treatment. The experimental group received instruction through the TGT cooperative learning model, while the control group received conventional instruction through lectures and assignments.

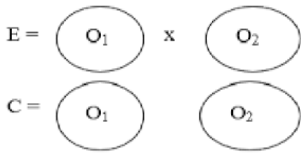

Figure 1. Experimental and Control Group Design

The population of this study consisted of all sixth-grade students at SD Muhammadiyah Bangkalan in the 2024/2025 academic year, totaling 64 students distributed across three classes. The sampling technique employed was total sampling, considering that the population size was fewer than 100 students. From the three available classes, a simple randomization procedure was conducted to select two classes as the research sample. Subsequently, the selected classes were randomly assigned as the experimental class and the control class, each consisting of 32 students.

Data collection techniques included tests, observations, and documentation. Two types of instruments were utilized in this study. First, a learning outcomes test in the form of multiple-choice questions was developed based on the competency achievement indicators of Integrated Science and Social Studies (IPAS). Second, an observation sheet was used to assess students' collaborative skills, covering five indicators: participation in group activities, responsibility for assigned tasks, respect for peers' opinions, equitable task distribution, and punctuality in task completion. Observations were conducted during the learning process by two trained observers.

Prior to implementation, the learning outcomes test instrument underwent content validity assessment through expert judgment and item validity testing using the product-moment correlation technique. The reliability of the test instrument was then measured using the KR-20 formula. Meanwhile, the collaborative skills observation sheet was tested for construct validity and inter-rater reliability using the kappa coefficient.

The collected data were analyzed using SPSS version 26 software. The analysis procedures included normality testing using the Shapiro–Wilk test and homogeneity of variance testing using Levene's test as prerequisite analyses. Hypothesis testing was conducted using an independent samples t-test to compare differences in learning outcomes and collaborative skills between the experimental and control groups. All statistical analyses were performed at a significance level of 0.05.

RESULTS AND DISCUSSION

Results

A total of 64 students from SD Muhammadiyah Bangkalan participated in this study. The students were divided into two groups: one group received instruction using the Team Games Tournament (TGT) cooperative learning model, while the other group received conventional learning instruction. All assessments of collaborative skills and learning outcomes were included in the final analysis. The results for each group are presented below.

Experimental Group

The experimental group consisted of 32 students who participated in the TGT cooperative learning model. The results are presented as follows.

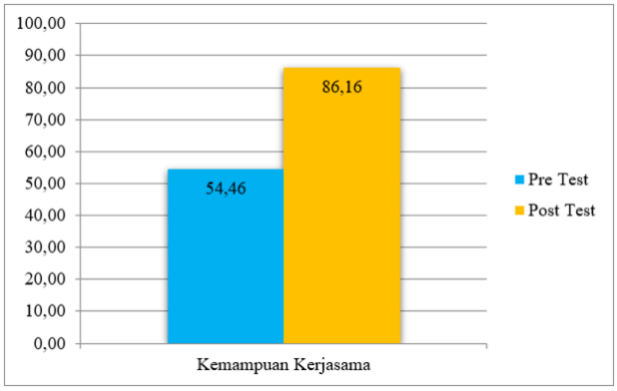

Figure 2. Collaborative Skills of the Experimental Group

The experimental group obtained a mean pretest score of 54.46 on the collaborative skills variable, which was categorized as "poor," as illustrated in the figure above. This category was based on the score range of 10%–55%. After the implementation of the TGT cooperative learning model, the mean posttest score increased to 86.16, placing it within the "very good" category (86%–100%). These findings indicate that students' collaborative skills improved significantly, shifting from the "poor" category to the "very good" category..

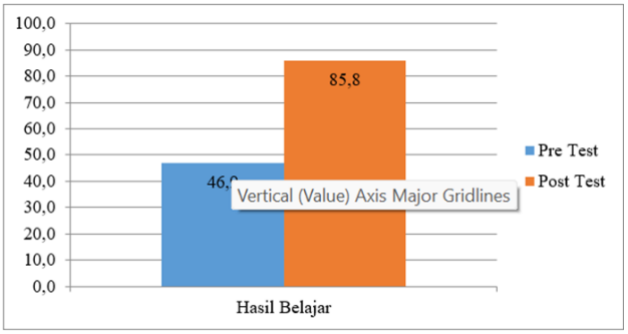

Figure 3. Learning Outcomes of the Experimental Group

As presented in the figure above, the average pretest score of the experimental group increased from 46.9 to 85.8 after the implementation of the TGT cooperative learning model. These results demonstrate a substantial improvement in students' learning outcomes following the treatment..

Control Group

The control group consisted of 32 students who participated in conventional learning instruction. The results are presented below.

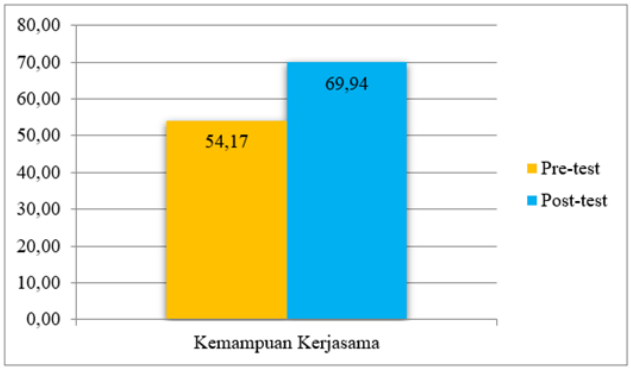

Figure 4. Collaborative Skills of the Control Group

Based on the figure above, the mean collaborative skills score of students in the control group increased from 54.17 on the pretest to 69.94 after conventional learning instruction. Although an improvement was observed, the increase was not as substantial as that of the experimental group.

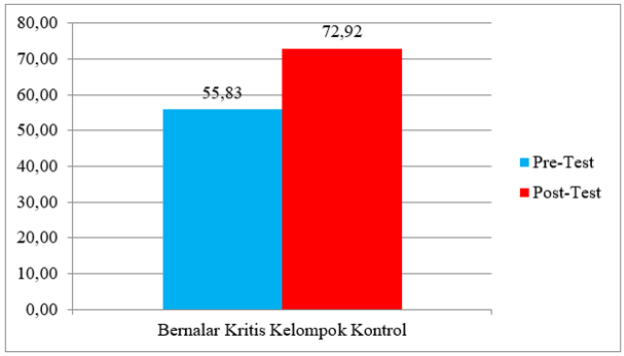

Figure 5. Learning Outcomes of the Control Group

Students in the control group also experienced an improvement in their learning outcomes. The mean pretest score was 55.83, which increased to 72.92 after participating in conventional learning instruction. However, the improvement remained lower compared to the experimental group that received the TGT cooperative learning model.

Prerequisite Tests

Normality Test

Table 1. Results of the Normality Test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pret Test Hasil Belajar	.224	32	.100	.935	32	.153
Pre Test Kerjasama	.154	32	.052	.910	32	.111
Post Test Hasil Belajar	.223	32	.088	.899	32	.106
Post Test Kerjasama	.163	32	.031	.877	32	.102

a. Lilliefors Significance Correction

The results of the Kolmogorov–Smirnov test revealed the following statistical and significance values: learning outcomes pretest (statistic = 0.224, df = 32, sig. = 0.100), collaborative skills pretest (statistic = 0.154, df = 32, sig. = 0.052), learning outcomes posttest (statistic = 0.223, df = 32, sig. = 0.088), and collaborative skills posttest (statistic = 0.163, df = 32, sig. = 0.031). The variables of learning outcomes pretest, collaborative skills pretest, and learning outcomes posttest demonstrated normal distributions because their significance values exceeded 0.05. In contrast, the collaborative skills posttest variable showed a non-normal distribution, as indicated by a significance value of 0.031, which was lower than 0.05.

Homogeneity Test

Table 2. Results of the Homogeneity Test

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Hasil Belajar	Based on Mean	2.434	1	62	.124
	Based on Median	2.713	1	62	.105
	Based on Median and with adjusted df	2.713	1	53.147	.105
	Based on trimmed mean	2.452	1	62	.122
Kemampuan Kerjasama	Based on Mean	4.426	1	62	.039
	Based on Median	2.964	1	62	.090
	Based on Median and with adjusted df	2.964	1	51.885	.091
	Based on trimmed mean	3.848	1	62	.054

The results of the homogeneity test indicated that the collaborative skills variable did not exhibit homogeneous variance, as reflected by a significance value lower than 0.05. In contrast, the learning outcomes variable showed no significant difference in variance across groups (p > 0.05), indicating homogeneous variance. Therefore, the assumption of equal variances was not applied in the independent samples t-test analysis for collaborative skills.

Hypothesis Testing

Collaborative Skills

Students' collaborative skills were analyzed using an independent samples t-test to compare the experimental group and the control group. The results are presented below.

Table 3. Results of the Independent Samples t-Test for Collaborative Skills

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Differenc e	Lower	Upper
Kerjasama	Equal variances assumed	4.426	.039	-8.295	62	.000	-16.23125	1.95668	-20.14259	-12.31991
	Equal variances not assumed			-8.295	53.519	.000	-16.23125	1.95668	-20.15496	-12.30754

As presented in the table above, the independent samples t-test for collaborative skills was conducted using the "equal variances not assumed" criterion. This decision was based on the homogeneity test result, which produced a significance value of 0.039, lower than the threshold of 0.05. The hypothesis testing revealed a significance value (two-tailed) of 0.000, which was lower than 0.05, indicating that the null hypothesis was rejected and the alternative hypothesis (H2) was accepted. These findings demonstrate a statistically significant difference in collaborative skills between the experimental and control groups. On average, the experimental group outperformed the control group by 16.231 points, with the confidence interval ranging from -20.143 to -12.320. This improvement in collaborative skills among sixth-grade students at SD Muhammadiyah Bangkalan indicates the effectiveness of the TGT cooperative learning model in enhancing students' collaborative abilities.

Learning Outcomes

The effect of the TGT cooperative learning model on students' learning outcomes was also analyzed using an independent samples t-test.

Table 4. Results of the Independent Samples t-Test for Learning Outcomes

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil Belajar	Equal variances assumed	2.434	.124	-5.309	62	.000	-13.06250	2.46036	-17.98069	-8.14431
	Equal variances not assumed			-5.309	53.118	.000	-13.06250	2.46036	-17.99710	-8.12790

Based on the information presented in the table, the significance value obtained from the homogeneity test was greater than 0.05, indicating that the assumption of equal variances was fulfilled. Therefore, the independent samples t-test for learning outcomes was conducted under the assumption of equal variances.

The hypothesis testing produced a significance value (two-tailed) of 0.000, which was lower than 0.05. Consequently, the first hypothesis (H1) was accepted. These findings indicate that the implementation of the TGT cooperative learning model had a significant positive effect on the learning outcomes of sixth-grade students at SD Muhammadiyah Bangkalan.

Discussion

The Effect of TGT Cooperative Learning on Learning Outcomes

The data obtained from the test instrument were used to assess students' learning outcomes through 15 multiple-choice questions developed based on Bloom's Taxonomy (Ricardo & Meilani, 2017). The instrument was administered to students in both the control and experimental groups during the pretest and posttest stages. The experimental group received instruction through the Team Games Tournament (TGT) cooperative learning model, while the control group received conventional learning instruction. The control group demonstrated an increase in the mean score from 55.83 on the pretest to 72.92 on the posttest. Meanwhile, the experimental group showed a greater increase, from a mean pretest score of 46.88 to a posttest score of 85.83. Although both groups of sixth-grade students at SD Muhammadiyah Bangkalan experienced improvements in learning outcomes, the improvement observed in the experimental group was substantially higher.

Critical Analysis: Why Was TGT More Effective?

The greater improvement demonstrated by the experimental group did not occur by chance. At least three causal mechanisms may explain this phenomenon. First, the TGT cooperative learning model integrates team collaboration with healthy academic competition. This combination creates positive pressure (eustress) that encourages students to prepare more effectively because team success depends on individual understanding. Second, the peer tutoring process within groups facilitates more concrete and contextual knowledge transfer compared to teacher-centered explanations alone. Third, the presence of team rewards fosters a sense of collective responsibility, motivating previously less-engaged students to participate more actively in order to avoid disappointing their team members. These elements are generally absent in conventional learning approaches that rely primarily on one-way lectures..

The experimental group also demonstrated increased motivation, active participation in classroom discussions, and greater enjoyment of the learning materials. The integration of game elements and academic competition created a learning environment that was both competitive and enjoyable. This condition contrasted with the control group, which tended to remain passive due to the exclusive reliance on lecture-based instruction. These findings are consistent with Slavin (2015), who argued that the TGT cooperative learning model effectively combines team-based learning with healthy competition, thereby enhancing student motivation. Similarly, Arends (2012) emphasized that TGT promotes student interaction, peer knowledge transfer, and deeper conceptual understanding.

Statistical Test and Critical Interpretation

The independent samples t-test showed that the significance value of the homogeneity test was greater than 0.05, indicating that the assumption of equal variances was fulfilled. The hypothesis

testing produced a p-value of 0.000 < 0.05, meaning that H1 was accepted. This result indicates a significant difference in learning outcomes between the experimental and control groups. On average, the experimental group achieved scores 13.0625 points higher than the control group. Furthermore, the paired samples t-test also yielded a significance value of p = 0.000, further supporting the acceptance of H1. After the implementation of the TGT cooperative learning model, the average increase in students' learning outcomes reached 30.08 points.

Additional Contributing Factors from the Local Context

Within the context of SD Muhammadiyah Bangkalan, which is located in the coastal region of Madura, students' characteristics and familiarity with communal culture and mutual cooperation appeared to support the effectiveness of the TGT cooperative learning model. Students adapted more easily to group-based learning activities because collective values had already been embedded in their daily social interactions. However, this contextual factor may also limit the generalizability of the findings, as the effectiveness of TGT may differ in schools characterized by more individualistic cultures.

Teachers also reported that students found it easier to understand science content while learning collaboratively, particularly when connecting scientific concepts to real-life applications through team discussions. Several students who initially struggled academically began to demonstrate improvement due to assistance provided by their peers. This peer tutoring process aligns with Lev Vygotsky's (1978) concept of the *Zone of Proximal Development*. In addition, the Self-Determination Theory proposed by Edward Deci and Richard Ryan (2000) explains that student motivation increases when learners experience autonomy, competence, and social relatedness. The TGT cooperative learning model fulfills these three psychological needs.

Research Limitations and Potential Data Bias

Despite the convincing findings, several limitations should be acknowledged. First, the quasi-experimental design without full randomization (only class-level randomization) introduces the possibility of selection bias. The experimental group had a lower pretest score (46.88) compared to the control group (55.83), meaning that the larger improvement observed in the experimental group may partly reflect regression toward the mean. Second, the learning outcomes instrument measured only lower-order cognitive domains through multiple-choice questions and did not assess deeper conceptual understanding or science process skills. Third, the presence of experimenter bias should be considered because the researcher also implemented the treatment in the experimental class. Without blind assessment procedures, the results may have been influenced by researcher expectations, commonly referred to as the Rosenthal effect. Fourth, the study was conducted within a single instructional topic and over a relatively short duration of less than four weeks. Consequently, it remains unclear whether the positive effects of the TGT cooperative learning model can be sustained over the long term.

Critical Comparison with Previous Studies

The findings of this study support previous research conducted by Fauzi and Masrupah (2024) as well as Wahyudin et al. (2023), which reported improvements in learning outcomes through the implementation of the TGT cooperative learning model. However, unlike those studies, which were generally conducted in urban schools with adequate facilities, the present study demonstrates that TGT can also be effectively implemented in schools with limited resources, provided that teachers possess adequate classroom and group management skills. This finding suggests that TGT may be considered a low-cost and adaptive educational intervention.

Febuar and Arafat (2024) also emphasized that TGT creates a stimulating educational environment that contributes to improved

learning outcomes. Nevertheless, previous studies rarely controlled for negative peer influence factors, such as the dominance of high-achieving students within groups or the increasing passivity of shy students. In the present study, the researcher observed unequal contributions among group members during the initial meetings. To address this issue, reinforcement of individual roles and rotation of responsibilities among group members were implemented. Without such interventions, the TGT cooperative learning model may potentially widen academic disparities rather than reduce them.

The Effect of TGT Cooperative Learning on Collaborative Skills

Data obtained from the observation sheets were used to assess students' collaborative skills through seven indicators: (a) integrating opinions, (b) appreciating others' perspectives, (c) identifying tasks and roles, (d) integrating within group activities, (e) demonstrating empathy, and (f) completing tasks on time. The observation sheets were administered at the beginning and the end of the learning process in both the control and experimental groups.

Critical Analysis: Why Did Collaborative Skills Improve?

The independent samples t-test produced a t-value of -8.295 with a mean difference of 16.23 points ($p < 0.001$). The homogeneity test for collaborative skills yielded a significance value of 0.039 (< 0.05), indicating unequal variances between the groups. The mean difference of -16.231 indicates that the experimental group outperformed the control group in terms of collaborative skills. This improvement was not only statistically significant but also substantively meaningful.

Several factors explain why the TGT cooperative learning model was able to improve collaborative skills dramatically. First, the structure of positive interdependence within the TGT model required students to depend on one another, as winning the tournament would not be possible without effective teamwork. Second, team rewards created tangible social consequences; students who failed to cooperate experienced social pressure from their teammates. Third, repeated interactions through several cycles of games and tournaments enabled students to internalize cooperative behaviors through habituation.

These findings reinforce the PIES principles (Positive Interdependence, Individual Accountability, Equal Participation, and Simultaneous Interaction) proposed by Kagan and Kagan (2009). Within the TGT cooperative learning model, positive interdependence develops because team success depends on the contribution of every member.

The paired samples t-test conducted in the experimental group produced a significance value of $p = 0.000 < 0.05$. The average increase reached 31.59 points, with a confidence interval ranging from 30.608 to 32.579. Furthermore, Cohen's d reached 11.56, indicating a very large effect size, meaning that nearly all students experienced substantial improvement in collaborative skills.

Deeper Theoretical Explanation

From the perspective of Albert Bandura's (1977) Social Learning Theory, the improvement in collaborative skills occurred through *observational learning*. Students observed their peers receiving recognition for cooperative behavior and subsequently imitated those behaviors. Meanwhile, from the perspective of Social Interdependence Theory proposed by David W. Johnson and Roger T. Johnson (2018), the TGT cooperative learning model creates *promotive interaction*, in which helping others simultaneously benefits oneself. This distinguishes TGT from conventional group work, which often fails due to the *free-rider effect*.

Measurement Limitations and Potential Data Bias

Despite these findings, the measurement of collaborative skills through observation carries several potential biases. First, *observer bias* may have occurred because observers were aware of which classes belonged to the experimental and control groups. As a result, ratings may have

unconsciously favored the experimental group due to expectancy effects. Although the study attempted to minimize this bias through the use of two trained observers and inter-rater reliability testing, the observations remained non-blind.

Second, the possibility of the *Hawthorne effect* should also be considered. Students in the experimental group may have demonstrated better collaborative behavior not solely because of the TGT model, but because they were aware that they were being observed. Third, the observation instrument only measured observable behaviors and did not assess internal dimensions such as willingness to compromise or deep empathy, which may not become visible within a short observation period.

In addition, the cultural context of Madura, which strongly emphasizes *tabe'* (respectfulness) and mutual cooperation, may have functioned as a confounding variable. Improvements in collaborative skills may partly reflect pre-existing cultural values rather than being entirely attributable to the TGT cooperative learning model. Without controlling for cultural variables, the generalization of these findings to more individualistic cultural contexts should therefore be approached cautiously.

The findings of this study are consistent with previous studies conducted by Walidah and Hariyani (2024) and Nurluthfiana and Rondli (2025), both of which reported improvements in collaborative skills through the TGT cooperative learning model. However, these previous studies did not report issues such as *social loafing* or the dominance of certain students within groups. In the present study, the research team observed that during the first meeting, approximately 20% of students tended to remain passive and relied heavily on higher-achieving peers. To address this issue, the researcher implemented individual quizzes as a component of individual accountability, which proved effective in reducing *free-riding* behavior. This finding indicates that the effectiveness of the TGT cooperative learning model is not automatic but depends heavily on the quality of teacher facilitation.

Gillies (2016) emphasized that the success of cooperative learning is strongly influenced by how effectively teachers guide communication processes and conflict resolution within groups. Therefore, although the TGT cooperative learning model provides a well-structured framework, the quality of implementation largely depends on the teacher's role. In this study, the teacher responsible for the experimental class received two days of special training prior to the intervention. Without such preparation, the results may not have been as effective as those obtained in this study. This condition represents another limitation of the research, as the study did not examine the implementation of TGT by untrained teachers. Consequently, the external validity of the findings remains limited to contexts involving teachers who have received prior instructional support and training.

CONCLUSION AND RECOMMENDATIONS

Based on the findings and discussion presented above, this study provides empirical evidence that the Team Games Tournament (TGT) cooperative learning model has a significant effect on the Integrated Science and Social Studies (IPAS) learning outcomes of sixth-grade students at SD Muhammadiyah Bangkalan. The results of the independent samples t-test revealed a significant difference in mean scores between the experimental and control groups, with a significance level of 0.000 ($p < 0.05$). In addition, the TGT cooperative learning model was also proven to have a positive effect on students' collaborative skills. The independent samples t-test showed a significant difference between the experimental and control groups ($p = 0.000 < 0.05$). Therefore, it can be concluded that the implementation of the TGT cooperative learning model simultaneously improves both collaborative skills and Integrated Science and Social Studies (IPAS) learning outcomes among sixth-grade students at SD Muhammadiyah Bangkalan.

Based on these conclusions, several practical implications may be considered by various stakeholders.

For Teachers

Elementary school teachers are encouraged to adopt the TGT cooperative learning model as an alternative instructional strategy that not only emphasizes academic achievement but also develops students' social skills. The implementation of TGT requires careful preparation, including the design of games and tournaments that align with the characteristics of the learning materials, as well as the formation of heterogeneous student groups. Teachers are also advised to provide brief training regarding students' roles and responsibilities within groups before the learning process begins in order to ensure effective group dynamics.

For Schools

Schools may consider incorporating the TGT cooperative learning model as one of the primary strategies for enhancing teacher professionalism, for example through lesson study programs or professional development training. School principals should provide opportunities and collaborative spaces for teachers to design TGT-based instructional materials collectively. In addition, schools may consider implementing the TGT cooperative learning model regularly in subjects requiring conceptual understanding and collaborative competencies.

For Policymakers

The TGT cooperative learning model may be categorized as a low-cost educational intervention capable of improving learning quality without requiring substantial additional resources. Educational authorities may therefore recommend this model within teacher training programs or instructional module development, particularly for schools with limited educational facilities and infrastructure. Furthermore, the model is highly relevant to the reinforcement of mutual cooperation values and the development of the Pancasila Student Profile.

Considering the limitations identified in this study, several recommendations for future research are proposed as follows.

Longitudinal Research

This study was conducted within a single instructional topic and over a relatively short duration of less than four weeks. Future studies are recommended to implement the TGT cooperative learning model over an entire semester to examine the long-term sustainability of its effects on students' learning outcomes and collaborative skills.

Cross-Cultural and Cross-Regional Studies

This study was conducted at SD Muhammadiyah Bangkalan, which reflects the communal culture characteristic of Madurese society. Comparative studies in schools characterized by more individualistic cultures, such as those in large urban areas, are necessary to determine whether the effectiveness of the TGT cooperative learning model remains consistent across different cultural contexts or is influenced by cultural factors.

Studies Controlling Confounding Variables

Future research should control for variables such as learning styles, initial motivation, parental support, and previous experiences with cooperative learning. Controlling these variables is important to isolate the specific effects of the TGT cooperative learning model more accurately.

Research Employing Blind Assessment Procedures

To minimize experimenter bias, future researchers are encouraged to involve observers and assessors who are unaware of the experimental conditions (blind or double-blind assessment). In addition, video recordings may be utilized to allow independent evaluators to conduct repeated assessments objectively.

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