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The Effect of The Teams Games Tournament Learning Model on Mathematics Learning Outcomes for The Addition of Whole Numbers in Elementary School

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ABSTRAK. Mathematics learning in elementary schools still faces obstacles. Among them, student learning outcomes remain suboptimal; one cause is the use of the lecture method, which tends to lower them. Therefore, it is necessary to implement learning strategies that increase active student involvement, such as the Teams Games Tournament (TGT). This study aims to determine the effect of the TGT learning model on mathematics learning outcomes in the addition of whole numbers material in elementary schools. This study is a quantitative experimental study with a pre-experimental one-group pretest-posttest design. This study involved a population of 77 students from Classes IIIA, IIIB, and IIIC at Assunniyah Kencong-Jember Elementary School. Using purposive sampling, 27 students from class IIIC were selected. Data collection techniques used questionnaires, observation, interviews, and documentation. Data were analyzed using normality tests and paired t-tests. The results of the research data analysis indicate that the TGT learning model has an effect on student learning outcomes. This effect is positive because the average pretest score is lower than the average posttest score.

Keywords: elementary school; learning outcomes; mathematics; teams games tournament

ABSTRAK. Pembelajaran matematika disekolah dasar masih mengalami hambatan permasalahan. Diantaranya hasil belajar siswa yang masih dikatakan belum sepenuhnya maksimal, salah satu dari penyebabnya yaitu menggunakan metode ceramah yang menyebabkan rendahnya hasil belajar siswa. Oleh karena itu diperlukan adanya pembelajaran yang mampu meningkatkan keterlibatan aktif siswa salah satunya yaitu model *Teams Games Tournament* (TGT). Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran TGT terhadap hasil belajar matematika pada materi penjumlahan bilangan cacah di sekolah dasar. Penelitian ini merupakan penelitian eksperimen kuantitatif dengan *pre-experimental one grup pretest and posstest design*. Penelitian ini melibatkan populasi sebanyak 77 siswa Kelas IIIA, IIIB, IIIC SD Assunniyah Kencong-Jember. Dengan menggunakan *purposive sampling*, terpilihlah siswa kelas IIIC yang berjumlah 27 siswa. Teknik pengumpulan data melalui teknik angket, observasi, wawancara, dan dokumentasi. Data dianalisis menggunakan uji normalitas dan uji *paired t-test*. Hasil analisis data penelitian menunjukkan bahwa terdapat pengaruh model pembelajaran TGT terhadap hasil belajar siswa. Pengaruh ini bersifat positif, karena rata-rata skor *pretest* lebih rendah dibandingkan rata-rata skor *posttest*.

Kata kunci: hasil belajar; matematika; sekolah dasar; *teams games tournament*

INTRODUCTION

Education is a series of processes that play a crucial role in national progress, encompassing a reciprocal and mutually influential relationship between students and educators (Samak et al., 2024). Through education, students are not solely focused on transferring knowledge but also on developing the potential, attitudes, and skills essential for life (Theo, Apia, & Purwojuono, 2026). This aligns with the mandate of Law Number 20 of 2003 concerning the National Education

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System, which stipulates that mathematics is a mandatory subject in the curriculum. Therefore, mathematics education is crucial and must be introduced in elementary schools (Qothrunnada & Sutriyani, 2025).

Regarding the importance of mathematics education in elementary schools, Ki Hajar Dewantara (one of Indonesia's leading educational figures) believed that education is the most important key to shaping the development of elementary school students. Therefore, the learning process in elementary schools needs to be better designed to encourage students to be more actively involved in learning, including in mathematics (Safitri, Putra, & Agrita, 2026).

However, mathematics learning in elementary schools still focuses solely on lecture methods, resulting in less active student engagement (Wardani, Lestari, & Witraguna, 2025). However, it is known that mathematics is an important subject and should be connected to everyday life situations (Nurjanah & Arifin, 2022). This is because mathematics requires logic and reasoning, not just focusing on thinking patterns and understanding knowledge (Susanti, 2020). Calculations also require logical reasoning to build student understanding and optimal mastery of the material (Hanapi, Hasan, & Nadjamuddin, 2026). However, many still consider mathematics to be less engaging and the most difficult subject.

One elementary school student stated that mathematics is very difficult because it contains many formulas (Musa, Ismiyanti, & Sari, 2025). Some students even say that mathematics is a very boring subject (Permata, Ismail, & Aeni, 2024), leading many students to still not like it (Diah & Siregar, 2023). Some students still consider mathematics a difficult subject to understand, compared to other subjects. Meanwhile, understanding mathematics requires a thorough understanding (Sandra, Theresia, & Nurbaiti, 2022).

This lack of understanding and motivation leads to suboptimal learning (Mabruroh & Munif, 2026). These problems impact low student learning outcomes, which tend to be suboptimal in material mastery and limited in cognitive aspects. The affective aspect is evident in students' attitudes and learning interests, and the psychomotor aspect is clearly visible in skills (Aisyah, Zahrah, Nikmah, Zahroh, & Budiyono, 2025).

Furthermore, students experience difficulties, including a lack of understanding and an inability to add. Many students remain confused and frequently make calculation errors. The low level of student engagement during mathematics learning is evident in their lack of active involvement. Teachers often employ conventional learning methods. As a result, students rarely ask questions and tend to be passive when teachers provide explanations (Hamida & Permatasari, 2026).

Furthermore, researchers conducted specific research. Based on observations at Assunniyah Kencong Elementary School, interviews with mathematics teachers, and various documentary evidence, various problems persist in mathematics learning in the classroom. Among these problems is the difficulty some students face in understanding the addition of whole numbers.

To overcome the various difficulties students encounter in learning mathematics, it is essential to implement learning models that pique interest and actively engage students. This is expected to improve learning outcomes across the three aspects of cognitive, affective, and psychomotor (Hartiningrum & Yanti, 2017).

Based on this description, improvements to learning activities are needed. The mathematics learning model used must be interactive to attract students' interest (Jannah, Husniati, & Sirajuddin, 2022). Selecting the right learning model is believed to improve student learning outcomes; one example is the Team Games Tournament (TGT). This learning model is considered to have a high success rate in improving learning outcomes (Mabruroh & Munif, 2026). This strategy not only familiarizes students with working in groups but can also foster motivation and enthusiasm for learning (Rezeki, Kurniawati, & Komaladewi, 2024). Therefore, implementing this model can create a conducive learning environment.

TGT is a cooperative learning model developed by David DeVries and Keith Edwards and further developed by Robert E. Slavin on 1995. TGT learning focuses on quizzes in which

students compete in teams. This is consistent with Slavin's theory, which states that in TGT, students collaborate with other team members (Aprimadedi, Marlianda, & Verliana, 2025).

TGT is a learning model that combines game elements and provides competition to create a new and popular learning environment. It focuses on team games and tournaments that test students' understanding of the material and facilitate their understanding (Agustin, Regina, & Wardani, 2024). According to Surya, the importance of using TGT learning is to create an interactive model that supports and directly engages students. TGT has been proven in this regard (Kurniawan, Zulnuraini, Kamisani, Azizah, & Guci, 2026).

The first implementation of TGT in classroom learning emphasized students learning together within their teams, playing games, competing against other teams, and participating in awarding activities (Simbolon, Sinaga, Tarigan, Sipayung, & Tanjung, 2026). Teams were rewarded for achieving the highest score among other teams during the TGT problem-solving phase (Aras & Khairunnisa, 2024). Learning using TGT was conducted in a group setting, with students divided into small, heterogeneous teams of 5-6 each, each team supporting one another within their group (Janah, Yelliza, Helmi, Apfani, & Tulljanah, 2025).

Several previous research findings indicate that implementing TGT in the classroom significantly improves learning outcomes (Qothrunnada & Sutriyani, 2025). This demonstrates that TGT is proven to be effective in delivering more engaging learning and encouraging student engagement.

The implementation of TGT also has a significant positive impact on the interactive learning environment, contributing to the success of the learning process in schools. According to Lestari & Gaol (2025), the gradual implementation of TGT can foster student engagement in class and achieve good learning outcomes. Furthermore, research by Setyawati et al. (2024) shows that the combination of TGT and number boards is more effective and significantly improves fourth-grade elementary school students' understanding and knowledge competency compared to conventional learning.

Although numerous previous studies have demonstrated that the TGT model is highly effective in improving classroom participation and learning outcomes, its implementation at the elementary school level remains limited and has not been fully maximized. This is even though mathematics learning requires active student participation and cooperation to facilitate understanding. This situation demonstrates the urgent need for further research to encourage active student participation in the learning process and to improve student learning outcomes significantly.

Although previous studies have examined relevant issues, this study brings a new dimension. This innovation lies in its being conducted in grade IIIC of an elementary school. Most previous studies were conducted in upper grades. Generally, TGT is implemented in upper grades because students are more capable of mature thinking, accustomed to working together, and have a better understanding. Elementary students, on the other hand, are still in the concrete thinking stage and require enjoyable and easily understood learning activities. Furthermore, previous studies have focused solely on cognitive learning outcomes. This study, in addition to examining learning outcomes as part of the cognitive aspect, also focuses on affective aspects such as student attitudes, interests, and engagement, as well as psychomotor aspects, namely physical skills related to the ability to act.

This research is expected to provide teachers with insights into designing and implementing TGT-based models, including the level of student engagement and response during learning activities, and the extent to which these models are effective in improving students' mathematics learning outcomes. Therefore, the results of this study are expected to yield mathematics learning strategies that are more engaging, appropriate, and aligned with the characteristics of students in elementary schools.

METHOD

This study employed a quantitative method with a pre-experimental, one-group, pretest-posttest design. This study involved only one group, grade IIIC students, as the sample, to receive the TGT learning needs. Measurement instruments were administered before (pretest) and after (posttest) the treatment.

This study was conducted at Assunniyah Kencong Elementary School, Jember Regency, located in Kencong Village, Jl. Patok Krajan 1, Kencong. The sample size was 27 grade IIIC students. The data population consisted of 78 students, divided into three classes: 26 in grade IIIA, 25 in grade IIIB, and 27 in grade IIIC. The sample size was selected from grade IIIC, with 27 students using purposive sampling. The sample size was determined based on criteria and considerations.

Based on the researcher's initial observations, grade IIIC students demonstrated greater difficulty in learning mathematics than other classes. Therefore, the sample selected for this study (grade IIIC) was deemed sufficient to determine the impact of TGT on student achievement and learning outcomes in the addition of whole numbers.

Initial data was collected through direct observation at the school in grade IIIC to identify students' difficulties in understanding the addition of whole numbers. Furthermore, preliminary data were also collected through teacher interviews. The interviews used a series of questions to identify the challenges faced in learning mathematics. These two techniques align with Sugiyono's suggestion that observations and interviews serve as supporting data to strengthen research findings (Sugiyono, 2020).

Furthermore, to answer the research question regarding the impact of TGT on learning outcomes, the researcher used a questionnaire to collect data. The distributed questionnaires were then collected and analyzed. Before using this questionnaire instrument in the study, its feasibility needed to be ensured. Therefore, the researcher conducted a validity test that included expert validation of content and constructs, language readability, and the practicality or suitability of the variable items. Validity testing was conducted to assess the validity of each item. Based on the SPSS analysis, only 11 of the 15 items tested were deemed valid. Invalid items were not used, while valid items were used in data collection.

Validity Test

The validity test used is empirical validity, a process tool in the testing stage to determine the extent to which the research instruments were used correctly. An instrument is considered valid if it aligns with the research objectives, describes the variables studied, and produces relevant data. A summary of the test results is shown in the following table.

Table 1. Summary of Validity Test Results

No Item	r_{xy}	Sign Greater Than or Less Than	r_{tabel}	Description
1	0,018	<	0,367	Not Valid
2	0,521	>	0,367	Valid
3	0,575	>	0,367	Valid
4	0,552	>	0,367	Valid
5	0,579	>	0,367	Valid
6	0,098	<	0,367	Not Valid
7	0,065	<	0,367	Not Valid
8	0,278	<	0,367	Not Valid
9	0,562	>	0,367	Valid
10	0,496	>	0,367	Valid
11	0,473	>	0,367	Valid
12	0,677	>	0,367	Valid
13	0,761	>	0,367	Valid
14	0,659	>	0,367	Valid
15	0,624	>	0,367	Valid

Based on SPSS analysis, only 11 of the 15 questionnaire items were valid. Questionnaires deemed invalid were not used as benchmarks in the research.

Reliability Test

Reliability Test is a method used to measure an instrument. An instrument is said to be reliable if it is able to provide relatively consistent data results and the same results when tested repeatedly, the data results can be trusted.

Table 2. Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	N of Items
0,84	11

Based on Table 2, ased on the results of the reliability test, it can be seen that N items are 11 questions, the value is 0.840. And analysis using SPSS statistics, the Cronbach's Alpha value is an indicator that is often used in statistical reliability tests. The results of the data show that the reliability test reaches 0.840. The data in this study can be used and the data is declared reliable.

Table 3. Questionnaire Instrument

Aspect	Learning Outcome Indicator Aspect
Cognitive Aspect	1. I can correctly add two whole numbers in long and short rows. 2. I understand the steps in solving whole-number addition problems. 3. I can work on whole number addition problems independently. 4. I can answer whole number addition problems correctly.
Affective Aspect	1. I feel confident when working on whole number addition problems. 2. I am enthusiastic about participating in math lessons on whole number addition.
Psychomotor Aspect	1. I can write the results of whole-number addition correctly. 2. I can use tools, such as my fingers, to calculate whole number additions. 3. I am active in working on whole number addition problems. 4. I can solve whole number addition problems effectively. 5. I am actively involved in mathematics learning activities in class.

Data analysis in this research aid was carried out using a quantitative approach using SPSS software version 25. The data analyzed were in the form of pretest and posttest scores obtained from the same group of students before and after receiving learning treatment.The initial stage of analysis was carried out through a normality test using the One-Sample Kolmogorov-Smirnov Test method to determine whether the data obtained were normally distributed. If the test results indicated that the normality assumption had been met, then the analysis was continued with a paired sample t-test. This test was used to determine whether or not there was a difference in the average learning outcomes between before and after the application of the treatment. The decision-making criteria were based on the significance value obtained, namely the data was considered normally distributed if the significance value was more than 0.05, while the difference in learning outcomes was declared significant if the Sig. (2-tailed) value was less than 0.05. Through these stages, this study sought to obtain evidence that showed the effect of the applied learning on changes in student learning outcomes.

RESULTS AND DISCUSSION

The data obtained from the research were first analyzed quantitatively using SPSS to ensure systematic, objective processing and adherence to statistical procedures. This analysis examined student learning outcomes before and after treatment in the experimental class using TGT learning. The initial stage of the analysis involved a normality test to determine whether the data were normally distributed, as these test results serve as the basis for determining the

appropriateness of using parametric statistical tests. Once the assumption of normality was met, the analysis proceeded with a paired-samples t-test to determine whether there were significant differences between pre- and post-learning scores. This test was used because the data analyzed came from the same group but were measured at two different points in time: before and after the learning treatment. Therefore, the results of this SPSS analysis serve as an empirical basis for assessing the effect of TGT learning on student learning outcomes.

Normality Test

The Normality Test is a test used to make it easier to find out whether the data used in the research is normally distributed or not, so that it can be known when analyzing the data using SPSS statistics.

Table 4. Results of Normality Test Using SPSS (One-Sample Kolmogorov-Smirnov Test)

		Unstandardized Residual
N		27
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	3.13729476
Most Extreme Differences	Absolute	.136
	Positive	.136
	Negative	-.089
Test Statistic		.136
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Based on the results of the Normality Test using the One-Sample Kolmogorov-Smirnov Test method, a significance value of 0.200 was obtained, which is greater than the significance level of 0.05. The results of this study indicate that the data is normally distributed. Further testing can be continued with the Paired T-test.

Paired Sample t-test

The Paired T-test is a quantitative statistical technique that can be used to compare pretest and posttest averages and to determine whether there is a difference before the pretest and after the posttest, and whether there is a significant difference.

The effect of the Teams Games Tournament learning model on mathematics learning outcomes in elementary school mathematics, including the addition of whole numbers

Table 5. Results of the Paired Sample Statistics on Overall Learning Outcomes

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	28.26	27	1.430	.275
	posttest	46.74	27	3.277	.631

The mean pretest learning outcome score was 28.26. While the mean posttest score was 46.74. The sample consisted of 27 students. Std. Deviation for pretest was 1.430 and posttest was 3.277. Std. Error Mean for pretest was 2.75 and posttest was 6.31. The mean pretest learning outcome score was 28.26 < posttest 46.74. It can be concluded that there is a difference in the mean pretest and posttest learning outcomes. To determine whether the difference is significant or not, paired sample correlations can be used.

Table 6. Results of the Paired Sample t-test on Overall Learning Outcomes

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest - posttest	-18.481	3.936	.757	-20.038	-16.925	-24.400	26	.000

Based on the Paired Samples Test table, the average difference between the pretest and posttest mean scores is -18,481, the standard deviation is 3,936, and the average standard error is 757. The 95% Confidence Interval of this average difference is -20,038 -16,925. The results show that H_0 is rejected and H_a is accepted, with a t value of -24,400 with sig. 0.000 <0.05. This indicates a significant difference between learning outcomes before the Pretest and after the Posttest. It is known that there is an influence of the Teams Games Tournament learning model on the learning outcomes of mathematics on the addition of whole numbers in elementary school.

The Effect of TGT on Cognitive Learning Outcomes

Table 7. Results of the Paired Sample t-test on Cognitive Aspect Learning Outcomes

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest - posttest	-6.778	3.274	.630	-8.073	-5.483	-10.758	26	.000

Based on table 7, the average pre-test score is -6.778, the standard deviation is 3.274, and the standard error is 630. The 95% confidence interval for the difference in these averages is -8.073-5.483. so that H_0 is rejected and H_a is accepted, with a t value of -10.758 sig.0.000 <0.05. It is proven that there is a significant difference in learning outcomes before the pretest and after the posttest. It is known that there is an influence of the Teams Games Tournament learning model on students' cognitive learning outcomes.

The Effect of the Team Games Tournament Learning Model on Affective Aspect Learning Outcomes

Table 8. Results of the Paired Sample t-test on Affective Aspect Learning Outcomes

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest - posttest	-3.037	1.454	.280	-3.612	-2.462	-10.854	26	.000

Based on the obtained an average pre-test score of -3.037, standard deviation 1.454. and standard error of 280. The 95% confidence interval for this difference is -3.612-2.462 so that H_0 is rejected and H_a is accepted, with a t value of -10.854 sig.0.000 <0.05. Identifying the significant

learning outcomes before the pretest and after the posttest, it is stated that there is an influence of the Teams Games Tournament learning model on Affective learning outcomes.

The Effect of the Teams Games Tournament Learning Model on Psychomotor Aspect Learning Outcomes

Table 9. Results of the Paired Sample t-test on Psychomotor Aspect Learning Outcomes

Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	pretest - posttest	-8.667	2.717	.523	-9.742	-7.592	-16.572	26	.000

Based on the results of the he average pre-test score value is -8.667, standard deviation 2.717 and standard error average 523. 95% confidence interval The average difference is -9.742-7.592 so that H_0 is rejected and H_a is accepted, with a t value of -16.572 sig.0.000 <0.05. The results can be seen significant differences in learning outcomes before the pretest and after the posttest. It can be stated that there is an influence of the Teams Games Tournament learning model on psychomotor learning outcomes.

Furthermore, based on observations and interviews regarding the implementation of research at SD Assunniyah Kencong, it was found that the TGT-based cooperative model had never been implemented. In contrast, according to the class IIIC teacher, the use of varied learning models was very important in the learning process, fostering students' enthusiasm for learning mathematics. The response of the Class IIIC teacher who was interviewed also showed a great interest in implementing learning with this TGT-based model, with a real statement: "Even though I have never implemented it, I know that when learning in class is very lively, students look active compared to learning that only uses the lecture method."

The TGT model not only emphasizes active learning but also integrates games to create a more enjoyable learning environment, preventing students from quickly becoming tired and disinterested in classroom activities (Handayani, Pawellangi, & Halim, 2025). Without this method, students are prone to boredom and lack enthusiasm for mathematics. Through TGT games, students can learn while playing, feel challenged, and are motivated to be more enthusiastic and active in mathematics learning. This makes the classroom learning process more active and less monotonous (Fadila, Kesumawati, & Sukardi, 2023).

During the learning process using the addition of whole numbers material, significant changes were observed compared to the learning process before the TGT implementation. Before the TGT implementation, students tended to be passive and less actively involved in the learning process.

This situation significantly impacted students' limited understanding of whole-number addition material. With the implementation of TGT in the learning process, improvements were seen. Students not only received information but also actively participated through group discussions, games, and tournaments. The class IIIC teacher stated that: "This model is very beneficial for students, namely, the improvement in student learning outcomes after the model is very visible. Previously, they were very inactive, but they have shown the courage to express their opinions and have begun to ask questions. Not only that, but cooperation in groups has also improved, especially students really like it because it includes a game element, namely, through the Team Games Tournament.".

This aligns with the results of an interview with a teacher in class IIIC. He stated that conventional mathematics learning, which relies solely on lectures, questions and answers, and assignments and exercises, creates a less-than-ideal learning environment. This leads to a lack of

active participation in learning, particularly in mathematics, as demonstrated by many students' dislike of the subject because they find it difficult to understand, especially in addition of whole numbers.

In this study, students found it easier to master the addition of whole numbers. They were able to solve problems more accurately through group discussions and academic games implemented in the learning process. The class IIIC teacher also stated that there had been changes, namely, "students' understanding of addition of whole numbers has significantly improved. Students can explain the steps in solving it. In addition, students are very careful when working on it and calculating correctly." Thus, the implementation of TGT has been proven to improve understanding and cognitive development in mathematics learning.

Furthermore, regarding affective learning outcomes, this study found that TGT significantly influenced students' affective learning outcomes. This achievement demonstrates that TGT can increase students' positive engagement in mathematics learning. This is indicated by increased enthusiasm, activeness, cooperation, and self-confidence during the tournament, leading to a more conducive classroom atmosphere. The class teacher of Class IIIC also stated, "Students' attitudes are starting to change positively; they are very enthusiastic, and group work is also improving." This indicates that TGT not only improves students' affective learning outcomes but also significantly encourages increased classroom engagement in mathematics.

Finally, regarding psychomotor learning outcomes, this study's data analysis indicates that TGT significantly affects students' psychomotor learning. The results demonstrate improved student skills in participating in learning activities, such as writing answers, using TGT media, and actively engaging in group work. Overall, the TGT learning model can create an engaging learning environment and foster positive student development in terms of learning outcomes. In line with this, the class IIIC teacher also stated that "Students were active in writing answers on the board, following the rules in the TGT game very orderly, not only that, students were able to write answers to questions very neatly and correctly." This has been proven to improve psychomotor learning outcomes and to train mathematical skills. The following is an example of student learning activities when learning using TGT.

Figure 1. One of the Learning Activities Using TGT

The research findings indicate that implementing TGT learning can influence student learning success. Bloom's Taxonomy Theory, proposed by Benjamin S. Bloom, analyzes learning outcomes across three main domains: cognitive, affective, and psychomotor. In the cognitive domain, TGT encourages students to participate in academic games and group discussions to

more actively understand the material and improve their critical thinking and conceptual understanding.

In the affective domain, tournaments and teamwork activities can boost students' self-confidence and collaboration, as well as improve their critical thinking and conceptual understanding. In the psychomotor domain, students have the opportunity to engage directly in the learning process through activities that involve games and group participation.

The results of this study indicate that implementing TGT significantly improves student learning outcomes. These results demonstrate that cooperative learning strategies that involve competition and interaction can positively impact student learning processes and outcomes. Furthermore, these findings align with several previous studies that found TGT effective in improving student learning outcomes because it can make classes more active and enjoyable (Magdalena, Islami, Rasid, & Diasty, 2020).

CONCLUSION

The results of this study clearly demonstrate that the TGT learning model significantly affects students' mathematics learning outcomes in elementary school, particularly in the addition of whole numbers. This finding indicates that the use of the TGT learning model significantly improves student learning outcomes.

Furthermore, observations revealed that this model can also create a highly engaging classroom atmosphere through enthusiastic teamwork in games. This resulted in students actively participating in games and teamwork activities between tournaments. Student motivation increased, and students began to express their opinions and became enthusiastic about mathematics learning. This facilitated students' understanding of whole-number addition more easily and effectively.

In addition to its impact on learning outcomes, the TGT model also fostered a sense of cooperation and sportsmanship, fostering students' confidence in solving math problems. Overall, the results of this study demonstrate that TGT is effective in positively impacting students, making it highly suitable for implementation in elementary school mathematics instruction.

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