



# Team Games Tournaments Learning Model Assisted by Question Cards on Improving Critical Thinking Skills

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## ABSTRACT

Critical thinking is important to be honed and improved. The purpose of this study is to measure the influence of the learning model of Team Games Tournaments (TGT) assisted by media question cards on the improvement of critical thinking skills of fourth grade elementary school students. This research method uses a quantitative approach with a quasi experiment method which is a non-equivalent control group design. This research involves a control class and an experimental class. The control class consisted of 21 students and the experimental class consisted of 31 students. The data collection technique in this study is in the form of a test with a test question instrument. The data analysis used is the Mann Whitney test. The results of the analysis obtained a significance value of 0.00 which is smaller than the probability of 0.05 so that there is a difference between the control class and the experimental class. From the comparison of pretest and posttest results, the difference in pretest and posttest scores in the experimental class was higher than in the control class. In conclusion, there is a significant influence in the use of the Team Games Tournaments learning model assisted by question cards on improving the critical thinking skills of fourth grade elementary school students.

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## INTRODUCTION

Critical thinking is important to be developed in daily life (Faiziyah et al., 2022; Chen, Lam, & Cheung, 2024; Rizki & Suprpto, 2024). Stating critical thinking skills as essential in education is not an exaggeration, as these cognitive processes play an important role in learners' ability to engage in critical analysis, problem-solving, and innovation (Faiziyah, 2022; Asha and Venkatesha, 2023; Kartal, 2024). Critical thinking is also one of the six key elements of the Pancasila Student Profile Strengthening Project launched by the Ministry of Education and Culture. One of the elements of the Pancasila Student Profile is critical reasoning. Critical thinking is one of the important 21st century skills to develop in students to prepare students to be involved in sustainable development (Pruneau, Kerry, & Langis, 2016).

Based on the results of a preliminary study that was carried out on November 7, 2023 in the fourth grade in three elementary schools in Trenggalek Regency, East Java, it was found that the problem of low critical thinking skills experienced by students was found. For example, when distributing question sheets, students mostly ask questions, but the questions are not filled out or done. From the results of the analysis of the critical thinking test questions given to students, as many as 75% of students did not complete it, showing low critical thinking skills. Another finding from the preliminary study is that teachers still rely on conventional learning models, namely lectures and memorization. As a result, during learning activities, students are observed to be less actively involved. The students were not actively asking or answering questions in the discussion. According to [Sianturi \(2018\)](#), the lack of response or participation of students in learning and the tendency to memorize rather than understand concepts can cause students' critical thinking skills to be poorly trained.

To improve these conditions, efforts are needed to develop critical thinking skills in the learning process. Critical thinking skills can be developed with the use of the right learning model. [Parindra et al \(2021\)](#) stated, through a creative and productive learning model, it can refer to effective learning processes and outcomes. The learning model needed to improve students' critical thinking skills is a learning model that can provide opportunities for students to think and construct knowledge. Providing opportunities for students to build common knowledge is a basic principle of effective pedagogy ([Jolliffe, 2015](#)). The learning model that meets these criteria is the cooperative learning model. The application of cooperative learning in the classroom can improve students' critical thinking skills ([Baloche & Brody, 2017](#)). Adequate research has been conducted on these cooperative learning models by comparing their impact on student achievement with conventional learning models, the Team Games Tournaments (TGT) model ranks in the top three cooperative models that have the most significant impact ([Hornby, 2009](#)).

However, implementing cooperative learning in the classroom has always been a challenge for teachers ([Baloche & Brody, 2017](#); [Buchs, et al., 2017](#)). Teachers play a key role in encouraging interaction among students and engaging them in the learning process, and cooperative learning is widely known as a pedagogical practice that can be applied in the classroom to stimulate students' interest in learning through their engagement with their peers. When children work cooperatively, they learn to give and receive information and develop new ideas and perspectives about how others think and communicate in socially appropriate ways ([Gillies, 2013](#)). In this study, the TGT learning model is combined with a game assisted by question cards. According to [Lailia \(2020\)](#), question cards are a learning medium in the form of games that are carried out in groups. This game is in the form of question cards that present pictures and problems that are blessed with daily life that occurs and those in the surrounding environment. So that when carrying out learning activities, students do not feel tense, and the situation is warmer so that the material or problems faced by students can be solved and can be answered. Question cards such as critical cards and flash cards can be useful for improving students' critical thinking skills ([Urcola-Pardo et al., 2018](#); [Erma, Koeswanti, & Giarti, 2019](#)).

This study aims to prove the influence of the Team Games Tournaments (TGT) learning model assisted by question cards to improve the critical thinking skills of fourth grade elementary

school students. Implementing games in learning can add positive value to the quality of learning (Arvanitakis, Palaigeorgiou, & Bratitsis, 2024). Games can create a fun and meaningful learning environment for elementary school students. Combining question cards with the TGT learning model is a creativity in the field of education that has an impact on the realization of quality education as aspired in the sustainable development goals (SDG's) plan. In addition, critical thinking skills can increase students' motivation, engagement, and enjoyment of learning (Kivunja, 2015).

## METHODS

This study used a quantitative approach with a quasi-experiment type. According to Sugiyono (2017), in the quasi experiment there was a control group but did not fully control other variables outside the researched. In other words, these other variables were considered influential. In this study, a quasi experiment was used to examine the influence of the Team Games Tournaments (TGT) learning model assisted by question cards on the improvement of critical thinking skills of fourth grade elementary school students. The experimental research design used in this study was in the form of a nonequivalent control group design. The experimental group and the control group were selected without a random placement procedure (Creswell, 2017). Both groups went through the pretest and posttest, but only the experimental group received treatment. The sample used was 4th grade elementary school students with 21 students as the control class and 31 students as the experimental class. The description of the design of the quasi experiment research in this study is as follows.

<b>Experiment</b>	O1	X1	O2
<b>Control</b>	O3	X2	O4

Information:

O1 = Average class pretest score  
Eksperimen

X1 = Assisted TGT learning model  
question cards

O2 = Average class post test score  
Experiment

X2 = Conventional learning model

O3 = Average pretest control class

O4 = Average posttest control class

The data collection technique in this study was in the form of a test. The instruments used were pretest and posttest questions. The data obtained were then tested for normality and homogeneity as a prerequisite test for analysis. Furthermore, the data was analysed using the Mann-Whitney hypothesis test. The Mann Whitney test was a non-parametric test used to determine the median difference of two independent samples. This test was used when the data did not meet the assumption of normality. This test was an alternative test to the independent t-test in the parametric test.

## RESULTS

The results of this study were taken from the pretest and posttest values of the control class and the experimental class. The sample used was fourth grade students from two elementary schools. The results of the study are presented in Table 1. Based on the data obtained, the average pretest score in the control class was 51, with the highest score of 80 and the lowest score of 20. The average posttest score in the control class was 71, with the highest score of 86 and the lowest score of 53. From the score data, it is known that the critical thinking ability of students in the control class has increased by 20 points seen from the difference in the average pretest and posttest scores.

**Table 1.** Control Class Research Results

<b>Student</b>	<b>Pretest</b>	<b>Minimum Criteria of Mastery Learning (70)</b>	<b>PostTest</b>	<b>Minimum Criteria of Mastery Learning (70)</b>
Student 1	53	Not Compliant	66	Not Compliant
Student 2	60	Not Compliant	66	Not Compliant
Student 3	60	Not Compliant	66	Not Compliant
Student 4	66	Not Compliant	73	Meet
Student 5	33	Not Compliant	80	Meet
Student 6	53	Not Compliant	60	Not Compliant
Student 7	40	Not Compliant	53	Not Compliant
Student 8	33	Not Compliant	66	Not Compliant
Student 9	60	Not Compliant	86	Meet
Student 10	60	Not Compliant	80	Meet
Student 11	40	Not Compliant	66	Not Compliant
Student 12	33	Not Compliant	73	Meet
Student 13	40	Not Compliant	73	Meet
Student 14	53	Not Compliant	73	Meet
Student 15	46	Not Compliant	73	Meet
Student 16	60	Not Compliant	73	Meet
Student 17	53	Not Compliant	60	Not Compliant
Student 18	20	Not Compliant	80	Meet
Student 19	80	Meet	80	Meet
Student 20	73	Meet	80	Meet
Student 21	60	Not Compliant	73	Meet
<b>Average</b>	51		71	
<b>Highest Scores</b>	80		86	
<b>Lowest Rate</b>	20		53	

The average pretest score in the experimental class was 49, with the highest score of 73 and the lowest score of 33. The average posttest score in the experimental class was 80, with the highest score of 93 and the lowest score of 73. Referring to the data, the critical thinking ability of students in the experimental class increased by 31 points as seen from the difference in the average score of the pretest and posttest. The improvement in critical thinking skills in the experimental class was 11 points higher than in the control class. The data from the research results in the experimental class were presented in the following Table 2.

**Table 2.** Experimental Class Research Results

No	Student	PreTest	Minimum Criteria of Mastery Learning (70)	PostTest	Minimum Criteria of Mastery Learning (70)
1.	Student 1	73	Meet	86	Meet
2.	Student 2	53	Not Compliant	86	Meet
3.	Student 3	46	Not Compliant	93	Meet
4.	Student 4	46	Not Compliant	86	Meet
5.	Student 5	66	Not Compliant	80	Meet
6.	6 students	53	Not Compliant	80	Meet
7.	Student 7	46	Not Compliant	80	Meet
8.	8 students	40	Not Compliant	86	Meet
9.	Students 9	60	Not Compliant	86	Meet
10.	10 students	46	Not Compliant	80	Meet
11.	Students 11	53	Not Compliant	80	Meet
12.	Students 12	60	Not Compliant	73	Meet
13.	Students 13	46	Not Compliant	73	Meet
14.	Students 14	53	Not Compliant	73	Meet
15.	Students 15	46	Not Compliant	80	Meet
16.	Students 16	60	Not Compliant	73	Meet
17.	Students 17	53	Not Compliant	86	Meet
18.	Students 18	53	Not Compliant	73	Meet
19.	Students 19	53	Not Compliant	73	Meet
20.	20 students	60	Not Compliant	86	Meet
21.	Students 21	26	Not Compliant	93	Meet
22.	Students 22	40	Not Compliant	80	Meet
23.	Students 23	40	Not Compliant	73	Meet
24.	Students 24	60	Not Compliant	80	Meet
25.	Students 25	40	Not Compliant	80	Meet
26.	Students 26	43	Not Compliant	80	Meet
27.	Students 27	33	Not Compliant	86	Meet
28.	Students 28	60	Not Compliant	86	Meet
29.	Students 29	40	Not Compliant	80	Meet
30.	30 students	40	Not Compliant	80	Meet
31.	Students 31	46	Not Compliant	73	Meet
<b>Average</b>		49		80	
<b>Highest Scores</b>		73		93	
<b>Lowest Rate</b>		33		73	

Next is the normality test. The test aims to find out whether the data is normally distributed or not. The test was carried out using the One Sample Kolmogrov Sminorv Test which was carried out through the SPSS 25 application. The results of the normality test are seen in Table 3. From the normality test, it is known that the significance value of the pretest data in the control class is 0.132 or greater than 0.05 so that it is declared normal. The significance value of the posttest data in the control class was 0.036 or less than 0.05 so it was declared not normally distributed. The significance value of the pretest data in the experimental class was 0.55 or greater than 0.05 so that the data was declared normally distributed. The significant value of the posttest data in the experimental class was 0.09 or greater than 0.05 so that it was declared to be a normal distraction. Referring to the test results, it can be concluded that there are three data that can be distributed normally, namely the results of the control class pretest, the results, the results of the experimental

class pretest, and the results of the experimental class posttest. The posttest data in the control class is not normally distributed.

**Table 3.** Normality Test

<b>One-Sample Kolmogorov-Smirnov Test</b>					
		<b>Pre_Con</b>	<b>Post_Co</b>	<b>Pre_Exp</b>	<b>Post_Exp</b>
		<b>n</b>	<b>n</b>	<b>e</b>	<b>e</b>
N		21	21	31	31
Normal Parameters <sup>a,b</sup>	Mean	51.24	71.43	49.58	80.55
	Std. Deviation	14.785	8.201	10.059	6.038
Most Extreme Differences	Absolute	.166	.195	.155	.185
	Positive	.134	.138	.155	.185
	Negative	-.166	-.195	-.117	-.173
Test Statistic		.166	.195	.155	.185
Asymp. Sig. (2-tailed)		.132c	.036c	.055c	.009c
a. Test distribution is Normal.					
b. Calculated from data.					
c. Lilliefors Significance Correction.					

Based on Table 6. It is known that the posttest results of the control class and experimental class of  $0.139 > 0.05$  indicate homogeneous. The last hypothesis test with a different formula is carried out, namely the Mann-Whitney formula, the purpose of which is to find out two free samples in nonparametric statistics, has the same purpose as the t-test in parametric statistics, namely to find out two free samples from the same population.

**Table 4.** Homogeneity Test

<b>Test of Homogeneity of Variance</b>					
		<b>Levene</b>	<b>d</b>	<b>df2</b>	<b>M</b>
		<b>Statistic</b>	<b>fl</b>		<b>r.</b>
Value	Based on Mean	2.266	1	50	.139
	Based on Median	1.398	1	50	.243
	Based on Median and with adjusted df	1.398	1	44.231	.243
	Based on trimmed mean	2.235	1	50	.141

Based on Table 5, the result of the signified value is 0.00 with the description of rejecting the null hypothesis. This means that H0 is rejected. Hypothesis testing of the difference between the control class and the experimental class stated that there was a significant difference.

**Table 5.** Mann-Whitney Hypothesis Test

Hypothesis Test Summary					
	Null Hypothesis	Test	Mr.	Decision	
1	The distribution of Nilai is the same across categories of Kelas.	Independent samples Mann Whitney U Test	.000	Reject	the null hypothesis

\*Asymptotic significances are displayed. The significance level is .05

## DISCUSSION

Based on the results of the analysis test presented in Table 5, data was obtained, namely the significance value of the Mann Whitney test results of 0.000. This value is less than the probability of 0.05 which means that there is a difference in critical thinking skills between students in the control class and the experimental class. The control class is a class that learns with a conventional model. The experimental class is a class that receives treatment in the form of learning with the TGT model assisted by question cards. The results show that the TGT model assisted by question cards has proven to be effective in improving critical thinking skills. The difference in critical thinking skills between students in the control and experimental classes can also be seen from the data presented in Table 1 and Table 2. It is known that the class of students in the control class experienced an increase in critical thinking skills by 20 points while the experimental class was 31 points. The data showed that the improvement in the experimental class was higher than in the control class. Thus, it can be said that the quality of learning in the experimental classroom can provide more effective results on students' critical thinking skills. The findings are in accordance with Wyk's (2011) research which proves that the TGT model can improve learning outcomes more effectively.

According to Franco (2016), critical thinking is a type of 'good' thinking used in everyday life to increase the chances of success. A critical thinker combines skill and willingness to achieve success. This means that critical thinking requires effort and a process that not everyone can do. This is because the critical thinking process also involves decision-making skills, which not only concerns the decision of how to act, but also the decision about what to believe (Ennis, 2013). Critical thinking involves the skill of analyzing the information provided to demonstrate the breadth of one's understanding and knowledge and the ability to discuss alternative perspectives on issues with open-mindedness (Shaheen, 2016).

Given the importance of critical thinking skills, students need to be trained to be able to develop qualified critical thinking skills. One way to improve critical thinking skills in students is to integrate them in learning activities. Superior and effective teaching requires a number of tools, techniques, and strategies (Wyk, 2011). One of the strategies that can be applied to create learning that stimulates critical thinking skills is to apply a cooperative learning model. The results of the research of Baloche & Brody (2017) have proven that the application of cooperative learning in the classroom can improve students' critical thinking skills. One example of the most effective learning model to improve critical thinking skills is Team-Games-Tournaments (TGT). The TGT learning model can make students more active and participatory in learning (Wyk, 2011). Students' activeness and involvement in learning is important to develop their critical thinking skills. This

is because critical thinking is a mental process, in which individuals need to actively and skillfully conceptualize, apply, analyze, synthesize, and evaluate information to reach answers or conclusions (Costa and Kallick, 2014; Changwong, K., Sukkamart, A., & Sisan, B., 2018; Özelçi, S. Y. & Caliskan, G., 2019; Muhammad, Darmayanti, & Arif, 2023).

Teams-Games-Tournaments (TGT) was originally developed by David DeVries and Keith Edwards at Johns Hopkins University as a cooperative learning model (DeVries et al. 1975; Wyk, 2011). In the TGT model, students play academic games in groups (teams) with other students with the aim of collecting as many points as possible for the team's victory (Wyk, 2011). During learning activities with the TGT model, students can collaborate with each other to unite their critical thinking to solve a problem so that they can get as many points as possible. Students are more active and enthusiastic in their learning and cooperate with each other and discuss critically with their teammates to win the game. In this study, the TGT learning model is combined with question cards learning media. Based on the results of the research, question cards can be used in learning to improve the critical thinking skills of elementary school students (Jatmiko et al., 2023). In another study, media similar to question cards, namely critical cards and flash cards, have been proven to be effective in improving critical thinking skills (Urcola-Pardo et al., 2018; Erma, Koeswanti, & Giarti, 2019). Thus, it can be concluded that card-based learning media can be useful for improving critical thinking skills.

Question cards are a form of creative learning that can help students learn in a fun way (Anna et al., 2022). In this study, question cards are combined with the Team Games Tournaments (TGT) cooperative learning model. The results are proven to improve students' critical thinking skills more effectively. These findings can have a positive impact on education in Indonesia, as well as education in general. The findings of this study can be a reference for teachers to be creative in creating card-based learning media and combining them with cooperative learning models, including TGT to develop students' critical thinking skills.

## CONCLUSION

The results of this study show that the Team Games Tournaments (TGT) learning model combined with media question cards has proven to be effective in improving the critical thinking skills of fourth grade elementary school students. This claim is evidenced by the findings of the analysis test with the Mann Whitney method which obtained a significance value of 0.000 (less than the probability of 0.05) resulting in  $H_0$  being rejected which means there is a difference. The difference in the improvement of critical thinking skills between students in the control class and the experimental class is also shown by the difference in pretest and posttest scores in the experimental class which is larger than in the control class. The positive impact of the findings of this study is to provide a reference for teachers to create innovative card-based learning media and combine it with cooperative learning models so that it can improve students' critical thinking skills.



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