



The Effect Of Tgt Assisted By Kahoot On Mathematics Learning Outcomes Students In Class V Elementary School

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ABSTRACT

The background of the problem in this study is the low learning outcomes of students in the subject of Mathematics, especially in the wide material of flat buildings. This can be seen from the fact that there are still many students who have not reached the Learning Goal Achievement Criteria (KKTP). Based on these problems, researchers applied the *Teams Games Tournament* (TGT) learning model with the help of Kahoot! media to determine its effect on student learning outcomes. The purpose of this study is to find out: (1) The use of the Kahoot! in grade V students, (2) student learning outcomes after participating in learning with the TGT model assisted by Kahoot!, and (3) The influence of the TGT model assisted by Kahoot! to the learning outcomes of Mathematics wide material flat building. This type of research is quantitative with a quasi-experimental method. The research population was 152 students and the sample was 60 students, the research sample was determined by *simple random sampling technique*, namely class V B as an experimental class with the treatment of the TGT model assisted by Kahoot! and class V D as a control class with conventional learning. The instruments used were in the form of objective tests and essays as well as observation sheets of student and teacher activities and documentation. Based on the results of the study, it was shown that there was a difference in the learning outcomes of the experimental class and the control class. The average learning outcome score of students in the experimental class was 81.67 higher than that of the control class of 64.17, with a significance of $0.000 < 0.05$, so the working hypothesis states that there is a significant influence on the use of the TGT learning model assisted by Kahoot media! to the learning outcomes of Mathematics of flat building broad material in class V students of SD Negeri 002 East Tanjungpinang.

Keywords: Mathematics Learning Outcomes, *Teams Games Tournament*, Kahoot Media

INTRODUCTION

Mathematics subjects in elementary school that have an important role in training students to think logically, analytically, and systematically. Mathematics is a very important science in human life, both for daily needs and in the development of science and technology (Amelia et al., 2022). Therefore, from kindergarten to elementary school, mathematics is a compulsory subject that must be given to students so that teachers have a great responsibility for the success of students in mastering mathematics.

Mathematics is a subject that deals with various abstract concepts, so in understanding it requires good reasoning skills. In order to master mathematics material, students must also have perseverance, tenacity, attention, and high motivation to learn (Sugiyanti, 2018) So that to be able to understand mathematics lessons well, students not only need intellectual skills, but also positive attitudes such as perseverance and high motivation.

Mathematics is one of the subjects that has an important role in the development of students' logical and analytical thinking skills, so Mathematics learning must be designed with interesting and effective methods and models so that students can more easily understand the concepts taught, one of the materials taught in class V is the area of flat building, which requires understanding of concepts and skills in applying formulas, However, in the learning process at school, various obstacles are still found that affect student learning outcomes. In mathematics learning, student learning outcomes, especially related to calculation operations on flat building area, are very important to assess students' understanding of the material taught with the target of learning objectives of calculation operations, especially in calculating flat building area, namely students master the basics of mathematics that can be applied in daily life.

Based on the results of interviews with homeroom teachers of grade V at SD Negeri 002 Tanjungpinang Timur, it was revealed that students' mathematics learning outcomes still did not reach the Learning Goal Achievement Criteria (KKTP) that had been set. There are several symptoms that occur during the learning process when observing grade V students at SD Negeri 002 Tanjungpinang Timur. Symptoms reflect the challenges and obstacles faced by students and teachers in carrying out mathematics teaching and learning activities, which can affect students' overall understanding and learning outcomes. The symptoms are:

1. Students tend to play while the teacher is explaining math lessons.
2. Students are less engaged in interaction with their peers in the classroom at the time of math learning.
3. Students lack enthusiasm and lack focus when learning mathematics.
4. Teachers rarely apply varied learning methods or models.
5. Lack of use of interesting media or learning aids in the mathematics learning process.
6. Lack of use of digital media in mathematics learning.
7. Students still consider mathematics to be a difficult subject.
8. There are still many mathematics learning outcomes of students who have not reached the KKTP

Based on preliminary data obtained from the homeroom teacher of Grade V at SD Negeri 002 Tanjungpinang Timur, it was found that around 60% of students scored below the KKTP (Minimum Mastery Criteria) of 70 in mathematics, particularly on the topic of plane geometry area. This indicates that the majority of students have not yet achieved the expected learning standards, highlighting an urgent need for more effective instructional strategies. Based on the symptoms of the problem mentioned, the learning model *Teams Games Tournament* (TGT) is a form of cooperative learning that is easy to apply to the focus of the problem by actively involving all students regardless of status, utilizing students as peer tutors, and integrating elements of play and reinforcement (Hasanah et al., 2020) .

The Teams Games Tournament learning model is a cooperative learning model that groups students in study groups of 4-5 people, with members with different abilities and backgrounds (Muhammad, 2015) In addition, this type of game in tournament learning involves students as tutors to deepen the material. The games applied in the TGT model require all participants to be active as a whole, thus encouraging students to be more responsible, able to work together, honest, have a healthy sense of competition, and be fully involved in the learning process (Asrofah, 2024). So, the learning model *Teams Games Tournament* (TGT) is a way of learning that combines group work and games such as tournaments. Students are divided into diverse groups, then students help each other to understand the material. Learning activities are more exciting because they involve games, but

still focus on learning objectives that make students more active. TGT also forms positive attitudes such as responsibility, cooperation, honesty, and the spirit of healthy competition.

The researcher also used the digital media Kahoot! as part of using the model *Teams Games Tournament* (TGT). Wow! is a learning platform that can be used by all ages, equipped with interesting features and easy to operate. This app is a simple but fun educational game suitable for students from elementary to college levels. (Fazriyah et al., 2020) In line with research conducted by Yuyun Wahyu et al. (2024), Kahoot! It is proven to make students more enthusiastic and active when learning and make the classroom atmosphere more exciting and fun because students can learn while playing quizzes (Wahyu et al., 2024).

The researcher chose to use the TGT model assisted by Kahoot media in order to create a more enjoyable and interactive learning experience for students. So, by using Kahoot!, in line with the opinion (Saputra, 2025) declare Learning media encourages students to engage in more active learning, not only by listening but also through observations, demonstrations, exhibitions, and other interactive activities. So thus students not only learn passively, but also actively compete and work together in teams to complete quizzes relevant to the broad material of flat builds. A combination of a cooperative TGT model and Kahoot media! Fun provides opportunities for students to learn in a more engaging way, strengthen their understanding, and effectively improve learning outcomes.

Although previous studies have shown that cooperative learning models such as TGT and digital media like Kahoot can improve student engagement, there is still limited empirical evidence examining the integration of both approaches specifically in elementary mathematics learning, particularly on plane geometry topics. Moreover, most studies focus on student motivation rather than measurable learning outcomes. Therefore, this study aims to fill this gap by investigating the effect of combining the TGT model with Kahoot media on students' mathematics learning outcomes of grade V students of SD Negeri 002 east tanjungpinang for the 2024/2025 academic year"

METHODS

This study employed a **quasi-experimental design using a pretest-posttest control group design**. The data analysis in this study was conducted using both descriptive and inferential statistical techniques to ensure accurate and reliable findings. descriptive statistics were used to summarize students' learning outcomes, including the mean scores of the pretest and posttest for both the experimental and control groups. This provided a general overview of students' performance before and after the intervention. Prior to hypothesis testing, prerequisite analyses were carried out to verify that the data met the assumptions required for parametric testing. The normality test was performed using the Shapiro-Wilk test on the pretest and posttest scores, as the sample size in each group was relatively small. A significance value greater than 0.05 indicated that the data were normally distributed. In addition, the homogeneity of variance was examined using Levene's Test to ensure that the variances between the two groups were equal. Once these assumptions were satisfied, the hypothesis was tested using the Independent Samples t-test to determine whether there was a statistically significant difference in learning outcomes between the experimental and control groups. The level of significance was set at 0.05. If the p-value was less than 0.05, the null hypothesis was rejected, indicating a significant effect of the treatment on students' mathematics learning outcomes.

Research Design

Based on the results of the normality and homogeneity test using mathematical practice values, two classes were determined as the main data sources of the research, namely the experimental class and the control class. The determination of this sample is summarized in Table 1 below

Table 1. Sample of Grade V Students of SD Negeri 002 East Tanjungpinang

Classes	Teaching Behavior	Number of Students
VB	Experimental Classes	30
VD	Control Class	30

The research is carried out in stages to ensure that the data taken is accurate and valid as follows:

1. The Preparation Stage includes preparing test instruments in the form of multiple-choice questions and descriptions based on the Independent Curriculum. This stage also includes the licensing process for school principals and parents regarding the use of gadgets in the classroom.
2. Validity & Reliability Test: Before use, the questions are tested and validated by practitioners (homeroom teachers and curriculum teachers) and analyzed using SPSS to ensure the instrument is feasible.
3. Implementation (Intervention):
 - a. Both groups were given a *Pretest* to measure initial ability.
 - b. The experimental group learned with the TGT model and the Kahoot! quiz, while the control group learned with the lecture method.
 - c. During the process, the researcher conducted participatory observations to record student activities and enthusiasm.
4. Final Stage: Both groups were given a *Posttest* to see changes in learning outcomes

Data Collection Techniques

Data collection techniques are a stage to obtain systematic and accurate information to reflect the actual conditions in the field. Data collection was carried out through two main approaches, namely test techniques and non-test techniques. The test technique is used as a measuring tool to evaluate student learning outcomes on the wide material of flat building. This test is prepared based on the Independent Curriculum applied at SD Negeri 002 Tanjungpinang Timur in the form of an instrument, namely preparing questions in the form of multiple choice (objective test) and description.

The procedure for implementing the test is given in two stages, namely the pretest before the intervention to measure initial ability, and the posttest after the treatment to assess the improvement of understanding with the criteria of student learning completeness which refers to the Learning Objective Completeness Criteria (KKTP) with a minimum score of 70. The success rate of student learning outcomes is categorized based on the value interval listed in Table 2 below

Table 2 Criteria for the Success of Learning Outcomes

Interval	Criteria
0 – 60	Need Guidance
61 – 70	Enough
71 – 80	Good

Furthermore, the non-test technique used is a method of assessing student learning which is carried out through systematic observation. This technique is also interpreted as a

way to collect information about learning progress without using tests. The data obtained through non-test techniques are as follows:

a. Observation Sheet

Observation is a method of data collection that is carried out by observing phenomena directly or indirectly, then recording the results of observations (Sembiring & Irmawati, 2024). Observation can be carried out in a participatory or non-participatory manner. In this study, the researcher observed students during the learning process by being directly involved. Participatory observation (*participatory observation*) is when an observer or researcher participates in an ongoing activity. The advantage of participatory observation is that the observed individual is unaware that they are being observed, so that situations and activities take place naturally and naturally. (Fatah, 2023).

In this study, observation sheets were used to monitor and assess student activities during the Mathematics learning process on flat building area material. The observations in this study are focused on the involvement of students in the learning process, such as participation in group discussions, cooperation in solving problems, and their enthusiasm in participating in each stage of learning using the model *Teams Games Tournament* (TGT) media-assisted Wow!. In addition, the observation sheet also serves to assess how well to use the TGT model combined with Kahoot media, including the implementation of learning steps, the readiness of teachers in delivering materials with the model, and the effectiveness of Kahoot in increasing student motivation and interaction in the classroom. Thus, the observations in this study not only record student activities, but also become a tool to evaluate the quality of the implementation of the learning model used. From the results of the observation sheet in learning activities, the percentage of average scores was sought using the following formula (Murtiana & Sulistyono, 2020)

$$\text{Average Value (NR)} = \frac{\text{Jumlah Skor}}{\text{Skor Maksimal}}$$

The criteria for the level of success of the action in the observation can be determined in Table 3 below

Table 3. Criteria for Observation Success Category

Interval Value Range	Criteria
86 - 100	Excellent
76 - 85	Good
60 - 75	Enough
55 - 59	Less
≤ 54	Very Less

b. Documentation Method

This study uses a documentation method to collect supporting data related to the implementation of the *Teams Games Tournament* (TGT) model. The data collected includes a list of students' grades from the pretest and posttest to see the improvement of learning outcomes, as well as a list of student attendance to find out their level of participation. In addition, photos and video recordings of learning are used as evidence of student activity in group discussions, Kahoot! games, and tournaments. The researcher also recorded the results of observations during learning to see student involvement so that with this documentation, the data obtained became more complete and could support the analysis of the learning model used.

Data Analysis Techniques

A. Data Analysis Techniques

The data analysis in this study uses descriptive analysis of inferential statistics to find out whether the learning model used has an effect or not. Before testing the hypothesis, the researcher first conducts a descriptive analysis and prerequisite test so that the data used is eligible. After the data is collected, the data is processed and analyzed with appropriate statistical methods, so that the results of the research can provide accurate and reliable conclusions

Hypothesis tests were carried out to find out whether there was an influence of learning outcomes between the experimental group and the control group after being given treatment. The type of hypothesis test used depends on the results of the normality and homogeneity test. In this study, the hypothesis test used is *Independent Sample t-Test* Because the data is distributed normally and homogeneously. Hypothesis testing in this study using SPSS with the *Independent Sample T Test*. *Independent Sample T Test* is a statistical test used to identify differences between two different samples. The interpretation of the data is carried out based on the significance value: if the significance value < 0.05 , then there is a significant influence between the two variables, while if the significance value is > 0.05 , the difference is not significant.

a. H₀ (Nihil Hypothesis)

This hypothesis states that the use of the TGT learning model with the help of Kahoot! does not affect the learning outcomes of Mathematics students in grade V of elementary school. This means that if this hypothesis is accepted, then learning with the TGT model with the help of Kahoot! does not provide a meaningful improvement in student learning outcomes.

b. H₁ (Working Hypothesis)

This hypothesis states that the TGT learning model is aided by Kahoot! affect the learning outcomes of Mathematics students in grade V of elementary school. In other words, there is a difference in learning outcomes between students who learn using the TGT and Kahoot models! with students who learn without using the model.

If the results of the statistical test show a sig value of < 0.05 , then the hypothesis is zero (H₀) rejected and alternative hypotheses (H₁) is accepted. This means that the TGT learning model is assisted by Kahoot! has a significant effect on students' mathematics learning outcomes, on the other hand, if the Sig value is > 0.05 , then H₀ not rejected, which means the Kahoot-assisted TGT model! does not have a significant influence on student learning outcomes, so it is not much different from the learning model in the control class

RESULTS AND DISCUSSION

a. The Use of the *Teams Games Tournament (TGT) Learning Model Assisted by Kahoot Media!*

In this study, the researcher used a learning model *teams games tournament (TGT)* with the help of Kahoot! which was applied in class V B as an experimental class with a total of 30 students. This learning is carried out in groups, where students are divided into several teams consisting of 4-5 heterogeneous groups who have different academic abilities. The learning process begins with Delivery of material by teachers Related flat build area, then continued with Team Discussion Where each group discusses the practice questions that have been prepared by the teacher. After that, the activity continued with Tournament Stage, which is a quiz session using Kahoot!, which contains evaluation questions based on the material that has been studied.

Each group member will answer questions individually through the device *Telephone* (HP) but the individual score will be accumulated into the team score. Through this system, all students are encouraged to actively learn because the success of the team depends on the contribution of each member. This activity also encourages students to think fast, collaborate, and feel positively challenged because of the fun and competitive learning atmosphere. At the end of the session, the teacher gives feedback on the results of the quiz and closes the learning with a brief reflection and reinforcement of the material. Students' math concepts through a fun and interactive approach.

Based on the results of observations made during the learning, the researcher obtained observation data regarding activities in participating in learning with the model *teams games tournament* (TGT) with the help of Kahoot!. Teachers and observers observe student activities in Mathematics subjects with flat building material during classroom learning,. Assessment of student activities is carried out using observation sheets. This comparison aims to see the difference in the level of student involvement during the learning process between experimental classes that apply the model *Teams Games Tournament* (TGT) with the help of Kahoot! and control classes that use conventional learning models or use lectures. The following are the results of the assessment of student activities in the learning process that have been calculated presented in Table 4 below:

Table 4. Student Activity Data

Number	Meeting Stage	Student Activities	
		Experimental Classes	Control Class
1	Meeting I	83,7	66,7
2	Meeting II	87,6	71,8
3	Meeting III	90,9	74,3
Rata – Rata		87,4	70,9
Category		Excellent	Enough

Based on Table 4., student activity in the experimental class was consistently higher than that of the control class at each meeting. At the first meeting, the average student activity in the experimental class reached 83.7 with the category Excellent, while the control class only obtained 66.7 with the enough. At the second meeting, student activity in the experimental class increased to 87.6 with the category Excellent, while the control class rose to 71.8 with the enough. The improvement continued at the third meeting, where the experimental class reached 90.9 with the category Excellent and control class 74.3 categories enough.

Overall, the average student activity in the experimental class was 87.4 with the Excellent, while the control class had an average of 70.9 with the enough. This difference shows that learning with the *Teams Games Tournament* (TGT) with the help of Kahoot! able to significantly increase student engagement compared to conventional learning methods used in control classes.

b. Mathematics Learning Outcomes of Experimental Class Students and Control Class on Flat Building Wide Material.

The results of the assessment at three meetings, in general, it can be seen that most of the students are in the Good category, which is as many as 11 students. In addition, there were 3 students who reached the Very Good category with an average score above 83. Meanwhile, 9

students are in the Sufficient category, and 7 other students are still in the category of needing guidance because the average score obtained is still below 60. These results show that the majority of students already have a good understanding of the material being studied. However, there are still a number of students who need further attention and guidance in order to improve the achievement of their learning outcomes so that they are more evenly distributed throughout the class. The average experimental class and control class are presented in table 5, which is as

Table 5 Average Experimental Classes and Control Classes

Meetings	Average	
	Experimental Classes	Control Class
1	77,13	63,00
2	82,77	68,60
3	86,97	75,00

Furthermore, the results of the posttest of the experimental class showed the average 81,55. This average falls into the category Excellent, meaning that most students have understood the broad material of flat building well after participating in learning using the model *Teams Games Tournament* (TGT) with the help of Kahoot!. Meanwhile, in the control class the average value 64.13 with Category enough, which shows that students' understanding of the material is still relatively low after participating in learning with the conventional methods presented in Table 6

Table 6. Results of Mathematics Teaching in Postest

Experimental Class	Control Class
81,55	64,13

The difference in average learning outcomes between the experimental class and the control class indicates that the use of the TGT model assisted by the Kahoot! more effective in improving student learning outcomes than conventional learning methods. The increase in learning outcomes in the experimental class is suspected to be due to the active involvement of students in learning activities, a fun competition atmosphere, and the use of interactive media that encourages motivation and concentration in learning.

c. The Influence of the Teams Games Tournament (TGT) Model Assisted by Kahoot Media! Towards Mathematics Learning Outcomes for Class V SD Negeri 002 East Tanjungpinang

Based on tests *independent sample t test* that has been done that the Sig (2-tailed) value is $0.000 < 0.05$, then it is in accordance with the basis for decision-making in the test *Independent Sample T Test* it can be concluded that H_0 rejected and H_a accepted, so that it can be concluded that there is an influence of the use of the Model *Teams Games Tournament* (TGT) With the help of Kahoot Media! Towards the Mathematics Learning Outcomes of Flat Building Broad Material Class V SD Negeri 002 East Tanjungpinang.

Usage Models *Teams Games Tournament* (TGT) with the help of Kahoot! Have a positive impact on student learning outcomes. Before this model was implemented, the learning process tended to be passive. Students lack focus when the teacher explains, rarely ask questions, and do not have space to discuss and exchange ideas with friends. This condition has an impact on low student learning outcomes. However, after the implementation of the *Teams Games Tournament* (TGT) Kahoot! In the experimental class, there is a significant change in the dynamics of learning. Students become more active and enthusiastic, because they are directly involved in learning activities that are competitive, fun, and collaborative. Students

become Dare to ask questions., both to the teacher and to the members of his group, and to be involved in Constructive group discussions.

Quiz game that uses the digital app Kahoot! It also makes learning feel more interesting and interactive. In addition, cooperation between group members becomes stronger, as each student has a role and responsibility in achieving a common goal. This shows that the *Teams Games Tournament (TGT) Kahoot!* not only improve learning outcomes, but also improve the overall learning process.

In the experimental class, the learning model is used *Teams Games Tournament (TGT)* with the help of Kahoot media, students are directed to work together in groups, discuss, analyze material, and participate in educational games through Kahoot as a form of fun evaluation. Students also share knowledge with each other in a positive competitive atmosphere. Meanwhile, in the control class, learning is carried out conventionally, namely with a direct explanation from the teacher, and students who do not understand the material can ask the teacher. The tasks assigned in the control class are individual without involving collaborative activities or interactive learning media as in the experimental class.

Usage Models *Teams Games Tournament (TGT)* with the help of Kahoot! have a positive influence on student learning outcomes in experimental classes. Students in this class show higher learning outcomes compared to control classes that use ordinary learning methods. This happens because in Models *Teams Games Tournament (TGT)* make students more actively discuss and work together in groups to solve the given problems. Media! also makes the learning process More fun and challenging, so that students are more motivated to participate actively. Through this interactive and collaborative learning activity, students' understanding of the material becomes better, and their learning outcomes can also improve.

Learning in the control class is still teacher-centric, so students only rely on explanations from teachers to understand the material. Because there is no group work or engaging learning medium, some students may have difficulty understanding the lesson. In contrast to experimental classes that use the model *Teams Games Tournament (TGT)* with the help of Kahoot, students are more active in discussions, learn together in groups, and participate in fun educational games. This method makes it easier for students to understand the material and the learning results are better than the control class.

The findings demonstrate that the TGT model assisted by Kahoot significantly improves student learning outcomes. This aligns with cooperative learning theory, which emphasizes the importance of interaction and collaboration in enhancing understanding. Students in the experimental group actively participated in discussions, shared knowledge, and engaged in problem-solving activities. This supports constructivist theory, where learning occurs through active involvement.

Additionally, the use of Kahoot reflects motivation theory, particularly intrinsic motivation. Game elements such as competition, instant feedback, and rewards increased students' enthusiasm and focus during learning. Compared to the control group, which relied on teacher-centered instruction, the experimental group experienced a more interactive and engaging learning environment. This resulted in better comprehension and higher achievement. Thus, the integration of TGT and Kahoot not only improves academic outcomes but also enhances the overall quality of the learning process.

CONCLUSION

Based on the results of research that has been carried out on the Influence of the Model *Teams Games Tournament (TGT)* With the help of Kahoot Media! Regarding the Mathematics

Learning Outcomes of Grade V Students of SD Negeri 002 East Tanjungpinang for the 2024/2025 Academic Year, the following conclusions can be drawn:

1. The use of the Kahoot! *Media-Assisted Teams Games Tournament* (TGT) model has proven to be able to create an active, interactive, and fun learning atmosphere. Students work in groups, discuss, and take individual quizzes through Kahoot! which accumulates into team scores. The observation results showed that student activity in the experimental class reached 87.4 with the very good category, while the control class was only 70.9 with the adequate category.
2. The learning results with the use of *the Teams Games Tournament* (TGT) model assisted by Kahoot! media in the experimental class obtained an average score of 81.67 higher than the control class that only used conventional methods obtained an average score of 64.17.
3. The Independent Sample T-Test results in a value of Sig. (2-tailed) = 0.000 < 0.05 and a tcount of 6.556 > a table of 2.001, so that H_0 is rejected and H_a is accepted. This means that the use of *the Teams Games Tournament* (TGT) model with the help of Kahoot! media has a positive and significant influence on the learning outcomes of mathematics students on the wide material of flat building.

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