

# IMPLEMENTATION OF THE TEAMS GAMES TOURNAMENT TYPE COOPERATIVE LEARNING MODEL ASSISTED WITH QUIZWHIZZER TO IMPROVE STUDENTS' COGNITIVE LEARNING OUTCOMES

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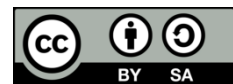
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## ABSTRACT

Student learning outcomes are still relatively low because the learning model applied in schools is still focused on teacher explanations. Therefore, researchers conducted research by applying a learning model that focuses on students, namely the Teams Games Tournament (TGT) learning model. This research aims to describe the cognitive learning outcomes of MTsS Miftahul Ulum eighth-grade students after the use of a TGT-type cooperative learning technique on the foundational aviation curriculum using Quizwhizzer. This kind of research employs a quasi-experiment with a posttest-only control design. Twenty multiple-choice questions from a posttest served as the data gathering tool. Both descriptive and inferential analysis were used to examine the data. The descriptive analysis's findings demonstrate that pupils in VIII 3 have superior cognitive learning outcomes than those in VIII 1. This is evident from the fact that the control class's average score is 70.31 and the class VIII 3 students' average score is 80.47. The independent sample t-test has a significance value of 0.000, or less than 0.05, according to the inferential analysis findings. Thus, based on the findings of these two analyses, it can be said that students in classes VIII 3 and VIII 1 and VIII 3 who performed better after applying the Teams Games Tournament learning model to basic airplane material had very different cognitive learning outcomes.

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## 1. INTRODUCTION

In order for students to actively develop their potential for having religious spiritual strength, self-control, personality, intelligence, and noble character in addition to the skills required by themselves, society, the nation, and the state, education is a conscious and planned effort to create a learning atmosphere and learning process. Based on the National Education System Law article 1 of 2003, it is stated that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, as well as the

skills needed by himself, society, nation and state (Dzulhidayat, 2022 : 2). Training and skill development for students in media, technology, information skills, and learning abilities are hallmarks of 21st-century learning. Learning physics is a component of scientific education, which is crucial to the advancement of education for the twenty-first century. Through experimental activities and classroom learning methods, 21st-century abilities in physics may be produced (Wahyuningsih et al., 2021 : 78). Physics is a scientific topic that stresses the processes involved in learning as much as the outcomes (Rizaldi et al., 2020: 33).

As far as possible, science learning, especially physics, can be taught in real terms using appropriate learning methods or media. This aims to ensure that the concept of the subject matter can be understood by students correctly and that what will be learned is always remembered by students. Thus, teachers teaching physics to students place more emphasis on mastering physics concepts as a result of the knowledge gained to improve student learning outcomes (Rahayu & Parrangan, 2021: 25). "A body of knowledge," which refers to physics as a result; "a way of investigating," which refers to physics as a process; and "a way of thinking," which refers to physics as an attitude, are the three main components of physics. Learning physics should include more than just memorization of formulae and numbers, since the subject matter is fundamentally complex (Aliyah, R., 2019 : 179).

Based on observations and interviews conducted at MTs Miftahul Ulum, shows that 68% of students said learning physics was categorized as difficult. This is because the learning method used by the teacher still uses the lecture method and explains based on the student handbook. So physics learning in schools generally still uses a teacher-centered learning approach. According to the 2013 curriculum, it no longer uses a teacher-centered approach, but is required to use a student-centered learning approach. Direct involvement of students can build their knowledge and encourage students' analytical skills so that learning outcomes can improve (Maulani et al., 2021: 145). The reality is that some students say that the subject that they have the most difficulty with is physics because it is one of the science subjects which is difficult to understand and very boring, which causes most students to not like physics lessons and this affects the student's learning outcomes. not as good as other subjects (Haryadi & Yusifa, 2021: 51).

Based on research findings in 2018, 15 year old science students in Indonesia received a score of 396. This is because it is still lower than the average score of 489 (PISA 2018 assessment results) for all participating countries. Organization for Economic Co-operation and Development (OECD), this score is considered quite bad. This is because the PISA questions include cognitive elements from six different levels of cognitive processes (Umami et al., 2021: 60). Therefore, it can be said that the cognitive capacity of Indonesian students is still below the average of OECD countries. One alternative to overcome various problems is the need to apply a learning model that can create active, creative, effective, and enjoyable conditions for students. Various kinds of learning models are developed so that students experience a meaningful learning process. Choosing a good learning model determines the teacher's success in the teaching and learning process (Jarukhi et al., 2020: 32).

Ega, S., Rahayu, F. S., Nurarafah, (2020: 3132) stated that the low learning outcomes of students are due to boring learning models, not involving active students, not using learning media, and no initial analysis of problems before carrying out activities. learning. A learning model is a foundation that accommodates techniques, methods, strategies, and approaches that teachers can use as guidelines when carrying out teaching and learning activities (Badriyah et al., 2021 : 3652).

Cooperative learning, in which the instructor serves as a facilitator and guide to help students achieve the learning objectives, is the learning paradigm that is anticipated to be able to overcome poor student learning results. Students use cooperative group learning; they are taught to share information, skills, and accountability for the group's success (Megasari, Rizza et al., 2020: 23). In order to help students locate and grasp concepts more readily and to solve issues with one another, cooperative learning is a methodology that includes groups of students working together as a team to solve problems, complete tasks, and accomplish learning objectives (Silalahi & Hutaaruk, 2020: 1684).

The cooperative learning model chosen in this research, namely Teams Games Tournament, is a learning model that is easy for teachers to implement in class and involves the activity of all students because it contains elements of play (Seran et al., 2019: 25). The use of a cooperative learning model based on the TGT type, which encourages students to actively explore their knowledge by growing in confidence and independence. Today's sophisticated technology makes it very simple for instructors and students to access information, enabling them to quickly locate a variety of resources and assessment techniques utilizing information technology at any time. An example of how technology is being used and developed is online assessment. One web tool that can be used in educational assessment is QuizWhizzer. QuizWhizzer is a game-based learning media. This learning media is used by teachers for interactive learning in creating student evaluation questions. Here teachers can make them with templates according to their wishes and are interesting. Apart from that, in the QuizWhizzer application there are various types of questions, starting from multiple choice, multiple responses, numerical answer, short answer, true or false, open-ended, drag and drop into text, ordering, slide, and random question (Iskandar et al., 2023 : 3341). According to Fajjah et al., (2022 : 96) in QuizWhizzer teachers can ask students questions in the form of a competition by following a certain path that has been prepared, resembling the Snakes and Ladders game system.

Learning outcomes are students' abilities obtained after learning activities to determine the extent to which students can understand and accept the lessons they have received from the teacher. Learning outcomes aim to measure students' success in learning carried out by teachers and at the same time measure students' learning success in understanding learning material (Buaton et al., 2021: 4067). Learning outcomes cover three domains (Ulfah & Arifudin, 2021: 5-6), namely cognitive, affective, and psychomotor domains. Teachers and students' experiences in the teaching and learning process determine whether a process is successful or unsuccessful, thus educators must have the guts to try new things in order to create engaging, dynamic, and meaningful learning experiences (Sirait, 2021: 51). Several earlier researchers have conducted this study. Using a classroom action research approach, one of the researchers used the Teams Games Tournament learning model (PTK). Miftia Ainul Arifah dan Fenny Widiyanti (2023: 93-97) claim that PTK is study that is not universal as it begins with real-world issues that instructors encounter.

The researcher is interested in studying the use of the TGT-type cooperative learning model with Quizwhizzer's assistance using the quasi-experimental research style, based on the problem description provided above. This kind of quasi-experimental study is applicable wherever as it is independent of the challenges that educators encounter. Based on this information, researchers carried out a study entitled "Application of the TGT Type Cooperative Learning Model to Improve Students' Cognitive Learning Outcomes". Therefore, by using the TGT-type cooperative learning

approach with Quizwhizzer's assistance with Simple Airplane content in class VIII, this study hopes to boost students' cognitive learning results via their high-level thinking skills.

## 2. METHOD

MTsS Miftahul Ulum conducted this study during the odd semester of Class VIII of the 2023–2024 school year. For the academic year 2023–2024, all 98 pupils in class VIII MTsS Miftahul Ulum which consists of 3 classes are included in the population. Using random sampling procedures, the study's sample was selected. Based on the drawing findings, two classes were identified: a control class in class VIII 1 that employed the direct instruction learning model, and an experimental class in class VIII 3 that used the TGT learning model with Quizwhizzer's scientific assistance. A posttest-only control group design and a quasi-experimental methodology are used in this study (Sugiyono, 2022: 76). Table 1 displays the Control Group Design for the post-test alone.

Table 1. Posttest-only Control Group Design

Group	Treatment	Posttest
Experiment	X <sub>1</sub>	O <sub>1</sub>
Control	-	O <sub>2</sub>

Source: (Sugiyono, 2022: 76)

Following the completion of the learning process, these two classes will get a posttest in the form of a 20-item HOTS question test, which will be administered as multiple choice questions using a cognitive learning outcomes exam sheet as an instrument. Following the acquisition of the post-test results for the experimental class (O1) and the control class (O2), descriptive and inferential analytic methods will be used to examine these scores. The data analysis technique in this research was carried out descriptively and inferentially. The descriptive analysis in question is cognitive learning outcomes which are calculated based on a benchmark assessment, with the formula:

$$Student\ grades = \frac{Total\ score\ obtained}{Maximum\ score} \times 100 \quad (1)$$

Cognitive learning outcome data is analyzed by calculating the comparison between the scores achieved by students and the specified maximum score. The cognitive learning outcome score categories obtained by students are as in Table 2.

Table 2. Cognitive Learning Outcome Score Scale Categories

No	Mark	Category
1	$85 \leq x < 100$	Very good
2	$70 \leq x < 85$	Good
3	$56 \leq x < 69$	Pretty good
4	$30 \leq x < 55$	Not good
5	$x < 29$	Very Not Good

(Source: Hapid. A, 2021: 232)

Inferential analysis was performed to ascertain the variations in cognitive learning outcomes between students who utilized the TGT learning model in the experimental class with Quizwhizzer's assistance and those who employed the conventional learning model in the control class.

### 3. RESULTS AND DISCUSSION

Research Study on using Quizwhizzer to support the TGT-type cooperative learning paradigm to enhance students' cognitive learning results on basic aviation content in class VIII MTsS The independent variable, the dependent variable, and the control variable are the three variables in Miftahul Ulum. Cognitive learning results are the dependent variable, the instructor and the identical content are the control variable, and the application of the TGT-type cooperative learning model with Quizwhizzer's assistance is the independent variable.

#### Descriptive Analysis

The results of the descriptive analysis revealed that the data analyzed in this research were test results on students' cognitive learning outcomes on fundamental aviation topics from the experimental class and control class. Data on cognitive learning outcomes were obtained from the posttest administered at MTsS Miftahul Ulum after the implementation of the TGT type cooperative learning model in class VIII 1 (control class) and conventional learning in class VIII 3 (experimental class). Quizwhizzer was helpful in this procedure. The results of a descriptive data analysis of the students' fundamental aviation material cognitive learning test scores for the experimental class and control class are shown in Table 3.

Table 3. Descriptive Analysis of Number of Students Based on Assessment Category

Mark	Category	Experimental Class		Control Class	
		Number of Students	Percentage (%)	Number of Students	Percentage (%)
$85 \leq x < 100$	Very good	12	37.50	4	12.50
$70 \leq x < 85$	Good	17	53.12	16	50.00
$56 \leq x < 69$	Pretty good	3	9.38	8	25.00
$30 \leq x < 55$	Not good	0	0	4	12.50
$x < 29$	Very less	0	0	0	0
Amount		32	100	32	100

(Source: Processed Data)

The average cognitive learning outcome for the students in the experimental class using the Teams Games Tournament cooperative learning paradigm with Quizwhizzer assistance is shown in Table 3. For cognitive learning results, 37.50% of students in the experimental class met the very excellent category, but only 12.50% of students in the control class fell into the very good group. The average score disparity across the experimental classes was 10.16 points. Therefore, based on the decision making category, the average difference produced in this study has a positive

value, so it can be interpreted that student learning outcomes increase by implementing the TGT type Cooperative Learning Model assisted by Quizwhizzer. Ilham et al., (2023: 152) include remembering, understanding, applying, analyzing, evaluating, and producing as components of the new cognitive domain. The following graphic shows an analysis of the cognitive learning results for each component of the experimental class and control class.

### 3.1.1. Knowing (C1)

The first cognitive aspect is knowing or remembering. Knowing is the lowest cognitive level. In this category, there are two types of cognitive processes, namely the ability of students to recognize and remember specific or general things, such as methods. Principles and theories. In the posttest on the cognitive learning outcomes of students on Simple Aircraft material, there were 2 question numbers out of a total of 20 questions whose difficulty level was knowing, namely numbers 1 and 13. A comparison of the achievement results of students in both classes can be seen in Figure 1.

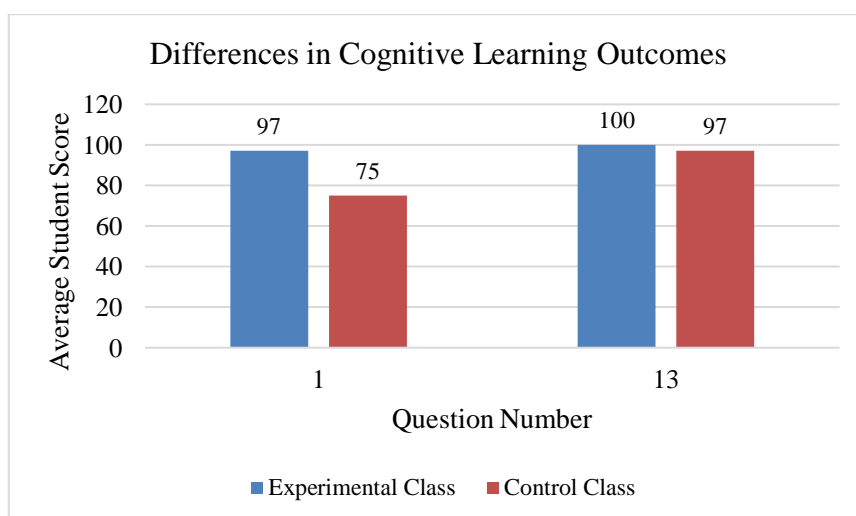


Figure 1. Graph of Achievement of Difficulty Level C1 (Knowing)

The indication of the degree of knowledge difficulty is shown in Figure 1. The experimental class is scoring 97% in the very good category, while the control class is scoring 75% in the good category. This indicates a substantial difference in average scores between the two classes in number 1. Thus, there is a 22% difference between the two groups. Regarding question number 13, both the experimental and control groups' average scores fall into the "very good" range. The average value for the control class was 97%, and 100% for the experimental class. The average difference between the two courses is not very large since the students in the experimental class and the control class have the same level of understanding of the material they have studied. This is also in line with research by Dwikurnia et al., (2023:43), experimental class students were superior because the class students apply Quizwhizzer assistance after the process learning to evaluate learning outcomes at each meeting.

### 3.1.2. Understanding (C2)

The second cognitive aspect is understanding. Understanding is a person's ability to understand a problem after remembering information related to the problem. Therefore, understanding has a higher level than remembering. The cognitive learning results of students on simple airplane material, there are a total of 4 numbers out of a total of 20 questions whose level of difficulty is understanding, namely numbers 6, 14, 15 and 16. Comparison graph of the achievement of experimental class and control class students for each question on the difficulty level of understanding can be seen in Figure 2.

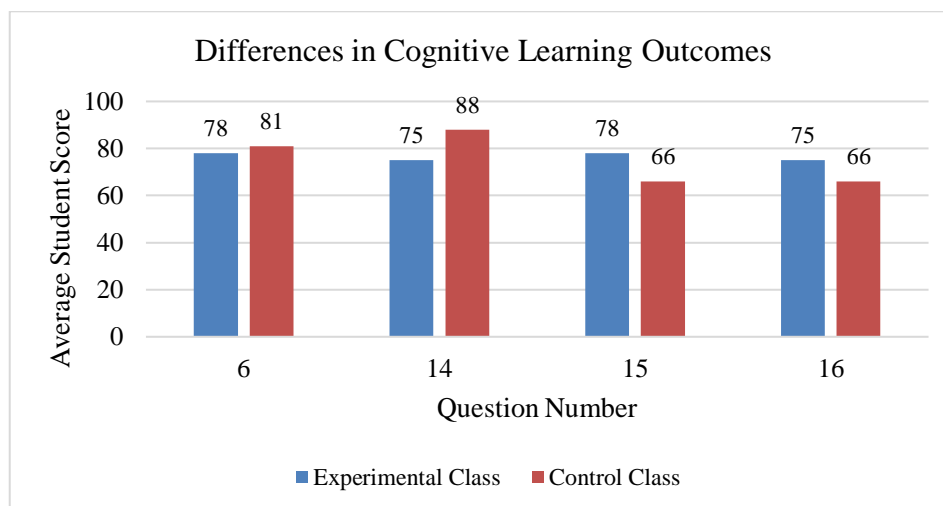


Figure 2 Graph of Achievement of Difficulty Level C2 (understanding)

The indication of the degree of comprehension difficulties is shown in Figure 2. Regarding question 6, there are variations in the mean scores of students in the experimental and control groups. As seen in Figure 2, the experimental class's score is lower than that of the control class. So the difference between the two classes is 6%. This is because question number 6 explains business in everyday life and is accompanied by the use of business formulas where students are still mistaken in differentiating between business applications and non-business applications. In response to question number 14, the experimental class's average score differential was 75% in the good category, compared to 88% in the very excellent category for the control group. The experimental class's score is lower than that of the control class. Question 15: The average scores of the two groups vary significantly; 78% of the experimental class falls into the good category, whereas 66% of the control class falls into the fair category. The average results for the two classes vary significantly in question number 16, with 75% of the experimental class falling into the good category and 66% of the control class falling into the fair category. This is due to the fact that students continue to misidentify pulleys, inclined planes, levers, and axle wheels in questions 14, 15, and 16 on the application and operation of basic machines. In line with research (Sofian et al., 2022: 183) that this research is to test students' understanding of facts and material concepts. So the experimental class is superior because it is assisted Quizwhizzer to improve students' understanding.

### 3.1.3. Applying (C3)

Here, "application" refers to using laws, formulae, techniques, and concepts in different circumstances or settings. In the posttest questions on the level of difficulty, there are 6 numbers out of a total of 20 questions on simple aircraft material, namely numbers 2, 3, 4, 10, 11, and 12. The difference in the achievements of the two classes for each indicator with the level of difficulty in applying can be seen in Figure 3.

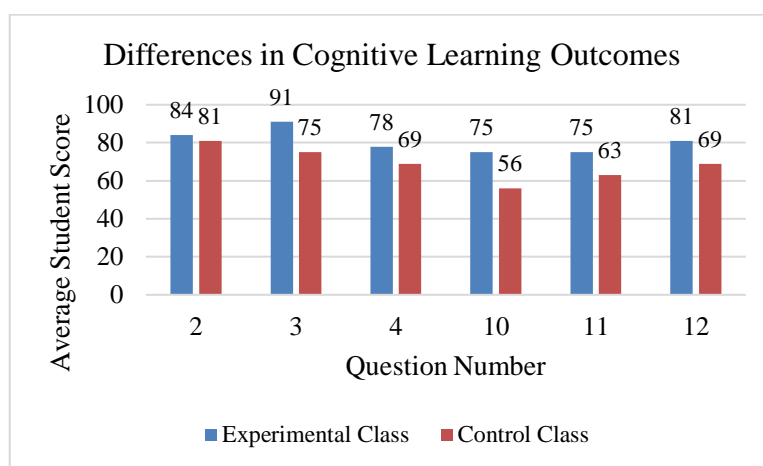


Figure 3 Graphic of Achievement of Difficulty Level C3 (applying)

Figure 3 displays an indicator of the level of application complexity. Number 2 makes it clear that there is no discernible difference between the percentages of students in the experimental class and control class about the topic they have learned. This is because both groups of students possess the same level of knowledge about the subject matter. The class percentage over 75% indicates that the experimental class as a whole seems to have comprehended the material in questions 3, 4, 10, 11, and 12. By comparison, the control class's percentage was below 75%, meaning that just a tiny number of the students in the class showed knowledge of the material. There is not much of an average difference between the experimental class and the control class at level C3 (application), as both groups of students have the same level of understanding of the material they have learned. This is consistent with Adyan et al., 2019:153), which shows that the experimental class's advantage is really caused by The learning motivation of the experimental group was greater than that of the control group. Outside internal and external factors of students, learning motivation of class students experiments are better because students are more enthusiastic about it learning using devices.

### 3.1.4. Analyzing (C4)

Analyzing means the ability of students to determine the parts that make up a particular form, object or problem so that students are able to show their relationship to each other. Analyzing includes the activities of distinguishing, organizing and attributing. These results do not show as much of a gap as in questions with difficulty C4. In the C4 difficulty level posttest questions, there are 3 question numbers out of a total of 20 simple airplane material questions, namely numbers 7,

19, and 20. A comparison of students' achievements for each indicator with difficulty can be seen in Figure 4.

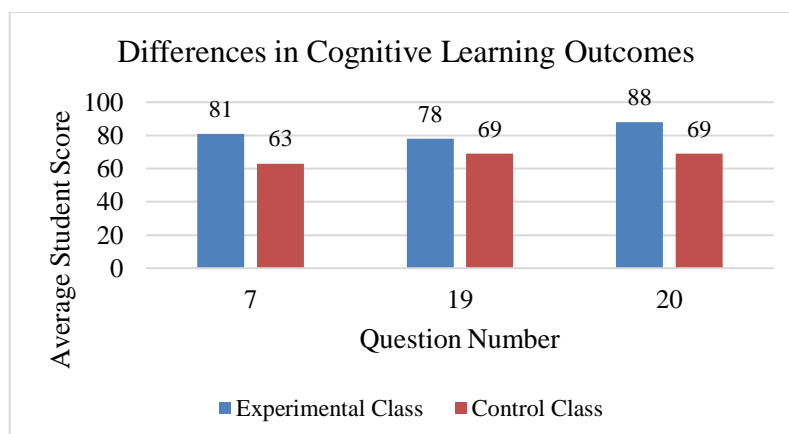


Figure 4. Graph of Achievement of Difficulty Level C4 (Analyzing)

The experimental class's achievement graph for questions 7, 19, and 20's analytical difficulty level is higher than the control class's. In reference to question number 7, the average percentage score for the experimental class in the good category was 81%, while the control class's average score percentage in the acceptable group was 63%. In question number 19, the experimental class's average score is 78% in the good category, while the control class's score is 69% in the fair category. This represents a considerable difference in average scores between the two groups. In reference to question number 20, the experimental class's average percentage score fell into the very excellent category at 88%, whilst the control group's percentage fell into the good category at 84%. If you look at Figure 4, question number 20 has the highest graph compared to the other questions, this is because students grasp the working principles of basic planes with the functioning principles of human muscles and skeleton. The diagram in Figure 4 attaches to the indicators of analyzing the class the experiment had better average cognitive learning outcomes than the class control. This is because the questions emphasize active participation for problem solving in the problem, so before finding a problem Students must first analyze the question in order to answer the question declared true (Solehat, Devi., Alatas, Fathiah., Oktora, 2020: 123).

### 3.1.5. Evaluate (C5)

Evaluating is related to cognitive processes that provide assessments based on existing criteria and standards. In the posttest questions on the level of difficulty, there are 3 numbers out of a total of 20 questions on simple aircraft material, namely numbers 5, 17 and 18. The difference in the achievements of the two classes for each indicator with the level of difficulty of application can be seen in Figure 5.

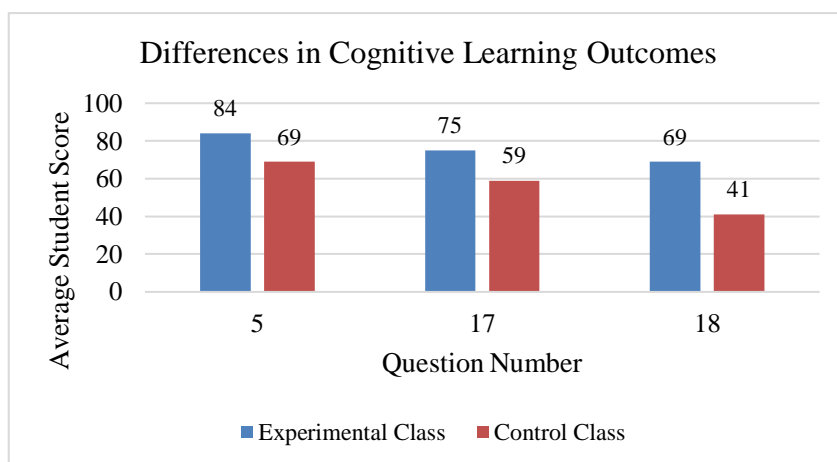


Figure 5 Graph of Achievement of Difficulty Level C5 (Evaluating)

The analytical difficulty level of problems 5, 17, and 18 on the experimental class's performance graph is higher than that of the control class. With respect to question number five, the experimental class averaged 84% in the good category and 69% in the acceptable category, respectively, compared to the control class. In question number 17, the experimental class's average score is 75% in the good category, while the control class's score is 59% in the fair category. This represents a considerable difference in average scores between the two classes. In response to question number 18, the experimental class's average percentage score fell into the adequate category at 69%, whereas the control group's percentage fell into the bad category at 41%. If you look at Figure 5, question number 18 has the lowest graph compared to the other questions, this is because students do not understand the benefits of inclined planes in everyday life. According to study (Billa et al., 2023: 284), students in the experimental class outperform those in the control class at the evaluating level (C5) because they are able to make judgments based on critical analysis, judgment, and deep thinking.

### 3.1.6. Creating (C6)

Creating means students work and produce something new. Creation activities include formulating, planning and producing activities. In the posttest questions on the level of difficulty, there are 2 numbers out of a total of 20 questions on simple aircraft material, namely numbers 8 and 9. The difference in the achievements of the two classes for each indicator with the level of difficulty in applying can be seen in Figure 6.

Figure 6 displays the creation difficulty indicator. The experimental class earns 81% of the potential points in the very good category, while the control group receives 63% in the fair category. This indicates a significant difference in the average scores between the two groups (see number 8). Answering question number 9, it was found that the experimental class had an 81% percentage and an average score in the good category that was 78% different from the control class's. The experimental class received a lower score than the control group. Because the students in the experimental class and the control class have the same degree of knowledge of the content they have studied, the average difference between the two classes is not too great. This is in line with research (Wulansari et al., 2023: 306) that the experimental class implemented the model learning that makes them able to apply the methods learned correctly and able to answer questions

related to cognitive levels creating (C6) which is linked to everyday life so that students It's easy to create an answer to this question.

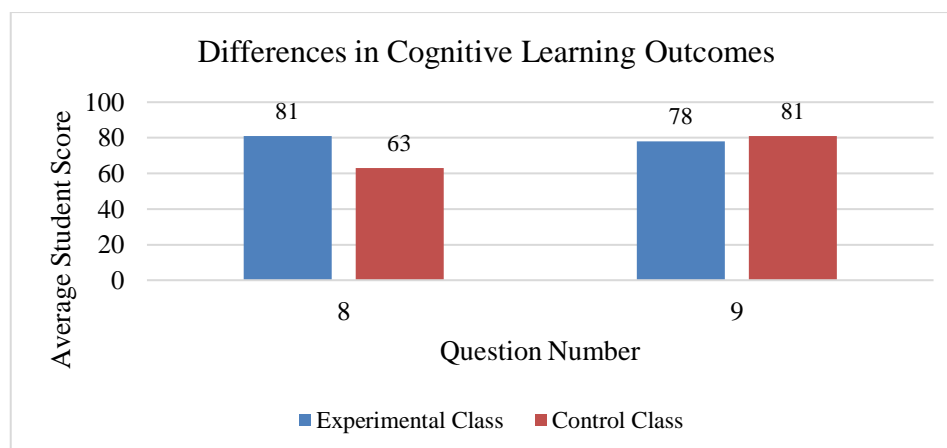


Figure 6. Graph of Achievement of Difficulty Level C6 (Creating)

### 3.2. Inferential Analysis

The Statistical Program for Social Science (SPSS 26) is then used to analyze data from students' cognitive learning outcomes that have been obtained from posttest results in the experimental class, which uses the TGT type cooperative learning model assisted by Quizwhizzer, with the control class, which applies conventional learning. The inferential analysis carried out in this research consisted of normality tests, homogeneity tests and hypothesis tests. Using SPSS 26 and the Kolmogrov-Smirnov method, the normality test was conducted. The results showed that the experimental class had a significance of 0.152 and the control class had a significance of 0.200. The data on how students in the control and experimental courses are improving their cognitive learning outcomes is normally distributed, as shown by the normality test results for both classes having a significance value of  $\geq 0.05$ .

Test for homogeneity via the one-way ANOVA method. The homogeneity test findings in this research showed that the two classes' data were homogenous since their significance values were both 0.236, or  $> 0.05$ . Following completion of the aforementioned homogeneity and normality tests, which satisfy the prerequisites, students' posttest results for the cognitive learning outcomes for both courses may be used to conduct hypothesis testing. The Independent Sample T-Test was used in this study's hypothesis testing. This hypothesis test aims to compare the cognitive learning results of the experimental class with the control class in class VIII using basic aviation material. The significance value achieved in sig. (2-tailed) is 0.000, or less than 0.05, based on the tests that were run. As per the t-test criteria, if the significance value is less than 0.05,  $H_a$  is accepted and  $H_0$  is rejected. This indicates that there is a noteworthy distinction in the cognitive learning outcomes of students in the control and experimental groups at MTsS Miftahul Ulum when it comes to the material on the Simple Plane.

This research is in line with research conducted by Wayan Sumandya & Gita Saraswandewi (2023: 3-5) that there is influence using the TGT learning model assisted by Quizwhizzer on the results student learning. This is proven by the learning completion achieved classically students were 80.43% with an average class score of 85.21. Besides that, research conducted by Siregar & Putri (2022: 35) is also consistent with studies carried out by academics.

According to research by Siregar & Putri, there were differences between the experimental and control classes' average posttest learning outcomes, with Sig. (2-tailed) 0.000, or less than 0.05, in each case. Consequently, as compared to traditional learning, learning using a particular kind of cooperative learning model the TGT improves student learning outcomes more.

The results of the research show that using a TGT-style cooperative learning model with Quizwhizzer support may improve students' cognitive learning outcomes. Regarding fundamental aviation knowledge, the inferential analysis shows a statistically significant difference in the test scores of students' cognitive learning outcomes between the experimental and control groups; additionally, the descriptive analysis shows that the average value of the students' cognitive learning outcomes in the experimental group is greater than that of the control group.

#### **4. CONCLUSION**

Based on research conducted in MTsS Miftahul Ulum's class VIII, with the title The application of the TGT type cooperative learning model assisted by Quizwhizzer to improve students' cognitive learning outcomes, the average cognitive learning outcomes of class VIII 3 students who applied the TGT type cooperative learning model were calculated. In class VIII 1, Quizwhizzer outperforms conventional learning. Apart from that, the cognitive learning outcomes of class VIII 1 (conventional learning) and class VIII 3 (a TGT-style cooperative learning model with Quizwhizzer as assistance) are significantly different. Thus, it can be said that using Quizwhizzer to support the Teams Games Tournament cooperative learning paradigm may help students in class VIII at MTsS Miftahul Ulum achieve better cognitive learning results while studying Simple Airplane curriculum.

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