

Differences of Students' Mathematics Learning Results using Student Team Achievement Division (STAD) and Expository Methods on Materials Build A Flat of A Rquange

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Abstract

In education in Indonesia, teacher upgrading is carried out, especially discussing the learning system that is suitable for use in the classroom. Among the existing learning systems is the Cooperative Learning system. Cooperative Learning learning system is defined as a group learning activity organized by the principle that learning should be based on changes in social information among its members, and take responsibility for their own learning and be encouraged to improve the learning of other members. This research is to see the Differences in Students' Mathematics Learning Outcomes Using the Student Team Achievement Division (STAD) Method and the Expository Method. The research method uses experiments. Based on calculations and data analysis, this study has shown that there are differences in learning outcomes between the treated class (experimental) and the untreated class (control). This proves that the mathematics learning outcomes of students whose learning process uses the Student Team Achievement Division (STAD) method are better than the mathematics learning outcomes of students whose learning process uses the expository method.

Key Words: Education, Math, Cooperative Learning.

1. Introduction

In order to improve education in Indonesia, teacher upgrading is carried out, especially discussing learning systems that are suitable for use in the classroom (Nurhadi, 2004). Among the existing learning systems is the Cooperative Learning system. This system is considered suitable for improving student learning achievement, especially in Indonesia, which still upholds the value of gotong royong in society (Mulyono, 2009).

The cooperative learning system is defined as a group learning activity organized by the principle that learning should be based on socially changing information among its members, and take responsibility for their own learning and be encouraged to improve the learning of other members (Noehi, 1995). This system is based on the philosophy of "homo homini socius", which recognizes that humans are social beings (Munawir, 2003).

Among the methods that can be applied in this cooperative learning system is the Student Team Achievement Division (STAD) method. The Student Team Achievement Division (STAD) method is an interesting learning method for students, where students are divided into several study teams consisting of four students with the ability to understand the material, gender, and ethnic background. The advantage of this method is that it can involve students in learning as well as teach other students, because each team member is responsible to other members of his team in

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delivering material and solving problems obtained. So that this individual responsibility causes all team members to get the same and equal understanding and mastery of the material.

The advancement of information and communication technology is a big challenge for the world of education in Indonesia (Jamal, 2011). It is hoped that this progress can be utilized properly and maximally for teachers and students so that learning becomes easier and at the same time able to bring out the existing potential in order to face this era of globalization (Syaiful, 2003.).

One of the learning methods that can be applied is the Student Team Achievement Division (STAD) type of cooperative learning method. This cooperative learning is the oldest and most studied cooperative learning. This method is also the most widely applied form of cooperative learning in many subjects (Wina, 2006).

In the Student Team Achievement Division (STAD) type of cooperative learning model, students actively build their own knowledge. By giving students to work actively in the learning process of mathematics, it means providing broad opportunities to use their abilities in developing their mathematical skills (Miftahul, 2011).

Cooperative learning is a learning model using a grouping system or small team, between 4-5 people who have different academic backgrounds, gender, race or ethnicity (heterogeneous). Johnson stated that: cooperative learning is the use of small groups in learning that allows students to work together. Slavin, put forward two reasons that: Cooperative learning is a form of learning that can improve learning so far (Slavin, 2005).

The method developed by Slavin involves "competition" between groups. Students are grouped variously based on ability, gender, race, and ethnicity. First, students study the material together with their group mates, then they are tested individually through quizzes.

The quiz scores of each member determine the scores obtained by their group. So, each member must try to get the maximum score in the quiz if their group is to score high. Slavin stated that the Student Team Achievement *Division* (STAD) method can be applied to a variety of subject matter, including science, in which there is a task unit that only has one correct answer.

Slavin (2005) made this model for several reasons. First, this model combines the effectiveness of cooperative and individual teaching programs. Second, this model emphasizes the social effects of cooperative learning. The STAD method consists of 5 main components: class presentation, quiz team, individual progress scores, Expository learning method is a learning method that emphasizes the process of delivering material verbally from a teacher to a group of students with the intention that students can master the subject matter optimally.

In the learning process with the lecture method must be sensitive to student responses. The description of the relationship between stimulants and responses is not as simple as expected, but the stimulants given interact with one another. And this interaction means that influencing the response given also produces various consequences that will affect student behavior.

Expository learning is a learning strategy that emphasizes the process of delivering material verbally, from a teacher to a group of students. With the intention that students can master the subject matter optimally. In this strategy, the subject matter is delivered directly by the teacher. Students are not required to find the material. The subject matter seems to be ready. Because the expository strategy emphasizes the process of speaking, it is often also called the "chalk and talk" strategy²⁰.

Using this method, students do not need to search and find facts, concepts and principles because they have been clearly presented by the teacher. Learning activities using the expository method tend to be teacher centered (Daryanto, 2010). The teacher actively provides explanations or learning information in detail about the learning material. The expository method is often analogous to the lecture method, because it provides the same information.

In general, teachers prefer to use the lecture method combined with the question-and-answer method. The lecture method is widely chosen because it is easy to carry out with simple preparation, saves time and energy, with one step it can directly reach all students and can be done in the classroom. Any presentation of information orally can be called a lecture. Presentations of lectures that are formal and usually last 45 minutes or informal ones that only last for

5 minutes. Lectures cannot be said to be good or bad, but the delivery of lectures must be judged according to their intended use.

The activity of the teacher speaking in the expository method is only carried out at certain times, such as at the beginning of learning, explaining the material, giving examples of questions. Student activities are not only listening, taking notes, or paying attention, but working on practice questions, maybe in this activity students ask each other. Work on practice questions with their friends, and a student is asked to work on the blackboard. When students do the exercises, the teacher's activities check student work individually and re-explain individually. If it is seen that a lot of student work is not perfect, the activity is followed by a classical explanation (Herman, 1988).

2. Methods

This purpose was held to state the differences in student learning outcomes in mathematics using the Student Team Achievement Division (STAD) method and the expository method on quadrilateral constructs in Class VII SMP Muhammadiyah 12 West Jakarta In semester 2. This study aims to examine the comparison of students' abilities, who participates in mathematics learning with the cooperative learning strategy of the Student Teams Achievement Division (STAD) type with students who participate in mathematics learning with the expository method, the research method used is the quasi-experimental method, quasi means pseudo, pseudo? So, sampling is obtained from existing class groups not based on individuals. So quasi-experiments are experiments obtained from sampling obtained from existing class groups not based on individuals, because of the element of manipulating treatment. Observations were also made during the teaching and learning process and carried out tests on mathematics subjects on the subject of rectangular flat shapes which were included in the type of quantitative description research.

3. Results

3.1. Descriptive Analysis

Class VII A student learning outcomes using the STAD method

From the results of students using the STAD method, the average = 70.83 median = 72, mode = 79.9, standard deviation = 11.49, variance = 59.7

Class VII B student learning outcomes using the Expository method

From the results of student learning using the expository method, the average = 53.7, median = 52.1, mode = 50.7, standard deviation = 11.08 variance = 54.9

3.2. Data Analysis Prerequisite Test Results

3.2.1. Normality test

Normality test to determine whether or not a data distribution is normal. This is important because parametric statistical tests require the data to be normally distributed. The normality test can be done in several ways, including: by interpreting the *ogive graph*, the coefficient of the skewness level, the Liliefors Test, the Chi-Square Test, or others. Determination of the normality of an inductive statistical data distribution must be done by testing. In inductive statistics testing is done, whether a sample data comes from a normally distributed population or not. Determination of the normality of a data distribution can be done by means of the Liliefors test.

The normality test was carried out using the Liliefors test with a significance level of $\alpha = 0.05$.

3.2.2. Homogeneity Test

The second parametric inferential statistical test requirement is homogeneity. Homogeneity testing was carried out in order to test the similarity of variance of each group of data.

The test for calculating the homogeneity of variance between groups was carried out using Fisher's exact test provided that the F_{hit} was between F_{tab} (accept H_0 if $\frac{1}{F_{tab}} < F_{hit} < F_{tab}$), $0.54 < 1.09 < 1.85$, then the sample comes from a homogeneous population.

Table 1. Normality Test Table for Class VII A

n	α	L_{hit}	L_{tab}	Conclusion
30	0.05	0.0818	0.161	Normal

Table 2. Normality Test Table for Class VII B

n	α	L_{hit}	L_{tab}	Conclusion
30	0.05	0.149	0.161	Normal

Table 3. Homogeneity Test Table

n	$\frac{1}{F_{tab}}$	F_{hit}	F_{tab}	Conclusion
30	0.54	1.09	1.85	Homogeneous

3.2.3. Hypothesis test

From the research results obtained $t_{hit} = 8.65$ while the calculation of t_{tab} with $n = 30$, $dk = 30 + 30 - 2 = 58$ is 2.00, it turns out that $t_{hit} > t_{tab}$ ($8.65 > 2.00$) so that H_0 rejected and H_i accepted.

Table 4. Table of Different Tests (t test)

n	α	t_{hit}	t_{tab}	Conclusion
30	0.05	8.65	2.00	H_i accepted

3.3. Discussion

Based on the data from the research conducted, it was concluded that the average student learning outcome using the STAD method was 70.83 higher than the student learning outcome using the expository method which had an average of 53.7.

These differences are caused by many factors that support each other, including the readiness of students to participate in learning, students who are given learning through the Student Team Achievement (STAD) method will be more prepared and more active in participating in learning activities, because students have the opportunity to improvise their knowledge and understanding without any fear of being laughed at by other friends.

Students who are given learning through the expository method will be more appropriate to use it for the field of social science studies, because this method does not provide opportunities for students to participate in the implementation of learning. Furthermore, from the results of statistical analysis, it was obtained that the value of t_{count}

= 8.65 this value was clearly greater than the value of $t_{table} = 2.00$. This result informs that the hypothesis used is acceptable which states that the results of students' mathematics learning who receive teaching through the Student Team Achievement (STAD) is higher than the mathematics learning outcomes of students who are taught through the expository method

4. Conclusion

Based on calculations and data analysis, this study has shown that there are differences in learning outcomes between the treated class (experimental) and the untreated class (control). Based on the results of the analysis obtained $t_{hitung} > t_{table}$ ($8.65 > 2.00$). This proves that the mathematics learning outcomes of students whose learning process uses the Student Team Achievement Division (STAD) method are better than the mathematics learning outcomes of students whose learning process uses the expository method.

References

- Daryanto. (2010). *Media Pembelajaran: Perannya Sangat Penting Dalam Mencapai Tujuan Pembelajaran*. Yogyakarta: Gava Media.
- Herman, H. (1988). *Mengajar Belajar Matematika*. Jakarta: Rineka Cipta.
- Jamal, A. M. (2011). *Tips Efektif Pemanfaatan Teknologi Informasi Dan Komunikasi Dalam Dunia Pendidikan*. Yogyakarta: Diva Press.
- Miftahul, H. (2011). *Cooperative Learning; metode, teknik, struktur dan model penerapan*. Yogyakarta: Pustaka Pelajar.
- Mulyono, A. (2009). *Pendidikan Bagi Anak Berkesulitan Belajar*. Jakarta: Asdi Mahasatya.
- Munawir, Y. (2003). *Pendidikan bagi anak dengan problema belajar*. Solo: Tiga Serangkai Pustaka Mandiri.
- Noehi, N. (1995). *Psikologi Pendidikan*. Jakarta: Universitas Terbuka.
- Nurhadi. (2004). *Kurikulum 2004 Pertanyaan dan Jawaban*. Jakarta: Grasindo.
- Slavin, R. E. (2005). *Cooperative Learning : theory, research and practice*. Bandung: Nusa Media.
- Syaiful, S. (2003.). *Konsep dan Makna Pembelajaran*. Bandung: Alfabeta.,
- Wina, S. (2006). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Jakarta: Kencana.