DIFFERENCES IN STUDENT CREATIVITY BY APPLYING THE COOPERATIVE LEARNING TYPE TPS AND LEARNING MODEL PBL

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Abstract

The purpose of this study was to see the differences in student creativity by applying 2 learning models, namely the TPS cooperative learning model and the PBL learning model in class VIII of the SMP Swasta Mentari Bangsa Medan. This research is an experimental research. The subjects in this study were all students of class VIII SMP Swasta Mentari Bangsa Medan which consisted of 2 classes. While the object in this study is the creativity of students in the TPS and PBL learning models. This research is supported by several tools such as lesson plans, student activity sheets (LAS), and student handbooks. The instrument used in this study was an essay test of 4 questions that had been tested and declared valid. The average TPS class student pretest was 34,243 while the post-test average was 40,729. PBL class students obtained an average pretest of 35.138 while the average post-test was 46.861. From the calculation results obtained = -3,212 and = 1,996 with dk = 54 and the real level = 0.05. It can be seen that tcount is not between the interval -1.996 <t <1.996 so that H0 is rejected and Ha is accepted. So from the results of research and hypothesis testing it is concluded that there are significant differences in student creativity by applying the TPS type cooperative learning model and the PBL learning model on cube and block material in class VIII of the SMP Swasta Mentari Bangsa Medan.

Keywords: Students Creativity, Cooperative Learning Type TPS, Learning Model PBL

Abstrak

Tujuan dari penelitian ini adalah untuk melihat perbedaan kreativitas siswa dengan menerapkan 2 model pembelajaran, yaitu model pembelajaran kooperatif tipe TPS dan model pembelajaran PBL di kelas VIII SMP Swasta Mentari Bangsa Medan. Penelitian ini merupakan penelitian eksperimen. Subjek dalam penelitian ini adalah seluruh siswa kelas VIII SMP Swasta Mentari Bangsa Medan yang terdiri dari 2 kelas. Sedangkan objek dalam penelitian ini adalah kreativitas siswa pada model pembelajaran TPS dan PBL. Penelitian ini didukung oleh beberapa perangkat seperti RPP, lembar aktivitas siswa (LAS), dan buku pegangan siswa. Instrumen yang digunakan dalam penelitian ini adalah test essay sebanyak 4 soal yang telah diujicobakan dan dinyatakan valid. Rata-rata pretes siswa kelas TPS sebesar 34,243 sedangkan rata-rata postes 40,729. Siswa kelas PBL diperoleh rata-rata pretes sebesar 35,138 sedangkan rata-rata postes sebesar 46,861. Dari hasil perhitungan diperoleh = -3,212 dan = 1,996 dengan dk = 54 dan taraf nyata = 0,05. Dapat dilihat bahwa thitung tidak berada diantara interval -1,996 < t < 1,996 sehingga H0 ditolak dan Ha diterima. Maka dari hasil penelitian dan pengujian hipotesis disimpulkan bahwa terdapat perbedaan kreativitas siswa yang signifikan dengan menerapkan model pembelajaran kooperatif tipe TPS dan model pembelajaran PBL pada materi kubus dan balok di kelas VIII SMP Swasta Mentari Bangsa Medan.

Kata Kunci: Kreativitas Siswa, Pembelajaran Kooperatif Tipe TPS, Model Pembelajaran PBL

INTRODUCTION

Mathematics is a field of study that plays an important role in education, this can be seen from the school hours more than other subjects. The main reason for the importance of mathematics is that the ability of students to do mathematics is the foundation and main vehicle which is an absolute requirement that must be mastered to be able to train students to think clearly, logically, systematically, and creatively, and to have the personality and skills to solve problems in everyday life.

Cockroft (Abdurrahman, 2012) suggests the reasons for the need to learn mathematics, namely (1) it is always used in all life; (2) all fields of study require appropriate mathematical skills; (3) requires strong, concise and clear means of communication; (4) can be used to present information in a variety of ways; (5) improve logical thinking skills, accuracy and room awareness; and (6) give satisfaction to the effort to solve the problem.

Based on these objectives the government has made reforms and efforts to make improvements to the education system, such as refining the curriculum and also increasing the ability of teachers through upgrading. Even so, student learning outcomes are still low, especially in mathematics, the fact is that every UN (National Examination) the average student who does not pass is a mathematics subject. This is a problem for teachers to choose teaching methods that attract students' attention to learn so that it creates interest and motivation for students to excel which will also support mathematics learning outcomes.

In fact, many teachers state that the reason for the low learning outcomes of mathematics in Indonesia is that students are less able to understand abstract material, students are less able to relate the knowledge they already have, this results in students being less enthusiastic about taking mathematics lessons. These conditions indicate the need for changes and improvements in an effort to improve student learning outcomes, namely by increasing the quality of learning to improve mathematics learning outcomes.

It can be seen, the low quality of education in terms of the process, is the assumption that so far the educational process in Indonesia that has been built by teachers is considered to be limited to mastering subject matter or relies on developing low-level cognitive aspects, which are unable to develop student creativity. This is in line with Guilford's expression (Munandar, 2009) in his speech which revealed that the most common complaint I hear about our college graduates is that they are quite capable of performing the assigned tasks by mastering the techniques being taught, however they are powerless when asked to solve problems that require new methods.

The above also happened to junior high school students where the researcher made observations. Students have difficulty solving math problems that require reasoning and understanding. If the questions given vary slightly, it is difficult to do them. This is due to the lack of student creativity in solving questions. In addition, the lack of student creativity is also caused by the inaccurate teaching methods used by the teacher. From the above statement it is necessary to make an effort to increase students' mathematical creativity, given the meaning of mastering mathematics for the future of the nation, gifted children in mathematics need special attention so that they can become the driving force for mastery of mathematics.

Currently the demands in the world of education have changed a lot (Lie, 2010; Luddin, 2008; Istiarsono, 2018; Gunawan & Widiati, 2019). We can no longer maintain the old paragraph that if a person has knowledge and expertise in a field, he can certainly teach. Many teachers still consider this old paradigm the only alternative. They teach with the lecture method expecting students to Sit, Silence, Listen, Note and Memorize (3DCH) and pit students against each other.

Learning mathematics in schools is important in educational activities in general. Therefore learning must be student-centered, not teacher-centered anymore. To get creativity is possible if the learning process stimulates the creation of student participation. One learning model that is able to increase student involvement actively in the mathematics learning process is a problem-based learning model. Ratumanan states that problem-based learning is an effective model for teaching higher-order thinking processes. This learning helps students to process information already in their minds and organize their own knowledge about the social world and its surroundings. This learning is suitable for developing basic and complex knowledge (Trianto, 2010). The problem-based learning model is a learning model that emphasizes the importance of the learning process in a group manner then begins with problem giving which aims to provide students with a stimulus so that they can learn well (Santoso, 2018; Padmavathy & Mareesh, 2013). Problem-based learning can help students reach a higher thinking stage than the memorization aspect, namely the understanding aspect as stated in the bloom taxonomy theory (Ananggih, Yuwono, & Sulandra, 2017).

Referring to the opinion that the problem-based learning model is a model that can give students the opportunity to play an active role and encourage student creativity, it can be assumed that this model can become a facilitator in developing and stimulating student creativity. In addition, a solution that can be applied to overcome the low creativity of students is to apply a cooperative learning model. In cooperative learning students learn together as a team in completing group assignments to achieve common goals. So, each member of the group has the same responsibility for the success of his group. Some experts claim that this model is not only superior in helping students understand difficult concepts, but is also very useful for fostering critical thinking skills, cooperating, and helping friends.

The application of this cooperative model is supported by Vygotsky's theory. In Vygotsky's theory, there is a direct relationship between the cognitive domain and the socio-culture. The quality of student thinking is built in the classroom, while their social skills are developed in the form of cooperation between students and other students who are more capable under the guidance of adults, in this case the teacher (Isjoni, 2010; Naldi, 2018). One type of cooperative learning model used in this study is Think-Pair-Share (TPS). The TPS learning model is an effective way to vary the atmosphere of class discussion patterns. Assuming that all recitation or discussion requires arrangements to control the class as a whole, and the procedures used in TPS can give students more time to think, to respond to and to help each other. Hartini, Maharani, & Rahman (2016) explain that TPS is designed so that students are trained to communicate to express various ideas that are on their mind during the learning process, both to teachers and their friends.

The learning model PBL (Problem Based Learning) and the TPS cooperative learning model are learning models with a constructivist flow. The constructivist school states that students must discover and transform complex information on their own, check new information with old rules and revise it when the rules are no longer appropriate. So based on this, this study aims to analyze the differences between the two models in reviewing students' creative abilities.

METHOD

This research is an experimental research. The subjects in this study were all students of class VIII SMP Swasta Mentari Bangsa Medan which consisted of 2 classes. While the object in this study is the creativity of students in the TPS and PBL learning models. The research mechanism consists of 3 stages, namely the preparation, implementation, and data analysis. In the preparation stage, what is done is compiling a learning plan using the TPS-type cooperative learning model and a learning plan using the PBL learning model on cube and

block material, making a lesson plan for each class in 4 meetings, where one meeting is 40 minutes, set the experimental class 1 and experimental class 2, and prepare data collection tools in the form of pretest and posttest. At the implementation stage, things that are done are validating the research instrument questions, holding the pretest, processing the pretest data in order to find out whether the two classes have mastered the prerequisite material or not. For the experimental class 1 was given TPS cooperative learning model treatment, while the experimental class 2 was given the learning model PBL treatment, and gave posttest to both classes. The time and duration of the posttest of the two classes are the same. At the data analysis stage, what must be done is to perform post-test data processing to test the hypothesis with the t test and conclude the research results. Student creativity test results data are grouped according to the following categories.

Table 1. Students' creativiats by category

No	Category of Score	Score
1	Very High	90 – 100
2	High	80 – 89
3	Average	65 – 79
4	Low	55 – 64
5	Very Low	0 – 54

Source: Masidjo (Livia, 2018)

RESULTS AND DISCUSSION

The purpose of this study was to determine whether there were differences in student creativity by applying the TPS cooperative learning model and the PBL learning model. Before carrying out learning with two different learning models, namely cooperative learning type TPS and PBL learning, first a pretest was carried out. The aim is to determine the students' initial abilities without being influenced by learning and become the basis for grouping students during learning.

From the results of the pretest giving, it was found that the average pretest score of the TPS class students was 34.24, while the pretest average score of the PBL class students was 35.13. It turned out that from testing the pretest scores for the TPS class and the PBL class, it was found that both classes had the same initial ability (normal) and the two classes were homogeneous. In summary, the pretest results of the two groups are shown in the following table.

Table 2. Data for TPS Class and PBL Class Pretest

Variable	N	Minimum	Maximum	Mean	Std. Deviation
TPS Class	28	20	52	34,2432	8,8392
PBL Class	28	20	55	35,1388	9,0905

Based on the average pretest of the two classes, it can be seen that both the TPS class and the PBL class have a relatively low average, so the research needs to be continued. After obtaining the initial abilities of each student, a heterogeneous group will be formed from the sample. For cooperative learning, each type of TPS consists of 2 people in one group and for PBL learning each consists of 5 people in one group with different abilities based on the ranking of the pretest scores.

Posttest Value of TPS Class and PBL Class

After knowing the initial abilities and forming groups, learning was carried out with two different learning models in the two TPS classes and the PBL classes, namely the TPS

class applied TPS type cooperative learning, while the PBL class applied PBL learning. At the end of the meeting, students are given a posttest. The purpose of giving the posttest is to determine the creativity of students from the two classes. In summary, the results of the posttests of the two groups are shown in the following table:

Table 3. Posttest Data for TPS Class and PBL Class

Variable	N	Minimum	Maximum	Mean	Std. Deviation
TPS Class	28	30	56	40,7297	7,4036
PBL Class	28	35	73	46,8611	8,8580

Based on table 3 the average posttest of the two classes is better than the pretest average. However, it is still seen that the average TPS class and PBL class have an average that is still low.

Student Creativity Test Results on TPS and PBL Learning Models

The results of the students' creativity tests were divided into 5 categories. The results of students' creativity tests on the TPS learning model based on category can be seen in the following table.

Table 4. Student Creativity in Quantitative TPS Class

No	Interval of Score	Amount of Students (People)	Persentase (%)	Category of Score
1	90 - 100	0	0	Very High
2	80 - 89	0	0	High
3	65 -79	0	0	Average
4	55 - 64	4	14,29	Low
5	0 - 54	24	85,71	Very Low
	Total	28	100	

From table 4 above, it is found that the average score of student creativity in the TPS class is 40.7297 and in table 4 there are 4 students or 14.29% whose level of creativity is in the "low" category and 24 students or 85, 71% are in the "very low" category. While the results of students' creativity tests on the PBL learning model based on categories can be seen in the following table.

Table 5. Student Creativity in Quantitative PBL Class

No	Interval of Score	Amount of Students (People)	Persentase (%)	Category of Score
1	90 - 100	0	0	Very High
2	80 - 89	0	0	High
3	65 -79	1	3,57	Average
4	55 - 64	4	14,29	Low
5	0 - 54	23	82,14	Very Low
	Total	28	100	

From table 5 above, it is found that the average score of student creativity in the PBL class is 46.8611 and in table 5 there is 1 student or 3.57% whose level of creativity is in the "sufficient" category, 4 students or 14, 29% were in the "low" category, and 23 students or 82.14% were in the "very low" category. Based on tables 4 and 5, it can be concluded that students' creativity in the PBL group is better than TPS. Student creativity also has a relationship with learning using the PBL learning model. Theoretically, learning with the PBL learning model has characteristics such as emphasizing the design of a problem so that students can construct their own knowledge which can spur students to maximize their creativity in learning. With this learning situation, students' creativity will increase and this creativity can help students to get better achievement (Aini, Mardiyana, & Sari, 2015).

Data Hypothesis Test

Before testing the hypothesis, the prerequisite test for normality and homogeneity is carried out. After it is known that the data of the two groups of students are normally distributed and homogeneous, then hypothesis testing is carried out. Hypothesis testing is carried out on post-test data and tested using two parties by comparing the average post-test difference between students who are taught with the TPS-type cooperative learning model and students who are taught with the PBL learning model. The test results at the significance level = 0.05 and $dk = n_1 + n_2 - 2 = 54$ with tcount = -3.21237 and $t_{table} = 1.996$, it is found that $-1.996 < t < 1.996$, so it appears that tcount is not in the interval which means that Ho is rejected and Ha is accepted. So it can be concluded that there are differences in students' creativity by applying the TPS-type cooperative learning model and the PBL learning model in class VIII of the Mentari Bangsa Private Middle School in Medan.

Based on the results of the hypothesis test, there are differences in the creativity of students who are taught with the PBL learning model and the TPS learning model, where the creativity of students in the PBL learning model group is better than students who get the TPS learning model. This is because the PBL learning model can help students develop thinking skills, problem solving and intellectual abilities through student involvement in real experiences (Putra, 2013). In the PBL learning model, the learning process begins with providing contextual problems that are in accordance with student characteristics, so that this provides a stimulus for students in developing their creativity to find the right solution to the problems they face. Tarhan and Acar (2013) in their research emphasized that PBL is like an active learning approach which has a very positive impact on learned achievement, mastering other concepts, and the development of some social skills. Some research results also show that the PBL learning model is more effective than the TPS learning model. Ayudya & Rahayu (2020) explain that based on the results of their research it is concluded that the Problem Based Learning learning model is proven to be more effective than using the "Think Pair Share learning model to improve critical thinking skills.

CONCLUSION

Based on the results of analysis and discussion as well as findings during learning with the PBL and TPS learning models, it was concluded that the average value of students' creativity abilities for the TPS class was 40.72. Whereas for the PBL class the average creativity ability of students obtained was 46.86. So it can be seen that the average creativity ability of students in the two classes is different, where the average creativity ability of students in the PBL class is higher than the average creativity ability of the TPS class. Based on the results of hypothesis testing, it was found that there were differences in students' creativity abilities between those taught by the PBL learning model and those taught with the TPS learning model.

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