COMPARISON OF DYADIC METHOD STRUCTURE AND LITTLE METHOD WITH BRAIN GYM COMBINATION ON THE ACTIVITIES AND LEARNING RESULTS OF CLASS VII STUDENTS OF SMP NEGERI 8 YOGYAKARTA

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ABSTRACT

The population in this study were eighth-grade students of SMP Negeri 8 Yogyakarta in the 2015/2016 academic year consisting of 5 classes. With the random sampling technique, class VII I was selected as the Structure Dyadic Method experimental class and class VII F as the Brain Gym experimental class. The design in this study uses factorial design. Data collection techniques using questionnaires and test methods. Questionnaire sheets are used to determine the level of student activity, while multiple-choice questions are used to find out the results of learning mathematics. The data collection instrument test uses a validity test and a reliability test. The data analysis technique used is the prerequisite test, normality test, homogeneity test, and hypothesis testing. The results of the experimental class hypothesis test with a significant level of 5% and dk = 62 indicate that: (1) there is a difference inactiveness in learning using the Structure Dyadic Method and lecture method with a combination of Brain Gym shown by $t_{count} = 2{,}119216$, $t_{table} = 2{,}002376$, so that $t_{Count} > t_{table}$ (2) there are differences in learning outcomes using the Dyadic Method Structure and lecture methods with a combination of Brain Gym shown by $t_{stat} = 2{,}362261, t_{table} = 2{,}003602$, so that $t_{count} > t_{table}$ (3) Structure Dyadic Method learning is better than learning lecture method with a combination of Brain Gym to the activeness and student learning outcomes, this is indicated by the activeness using the Dyadic Method Structure t_{count} =2,119216 and $t_{table} = 1{,}671969$, so that $t_{stat} < t_{table}$ and learning outcomes using the Dyadic Method Structure $t_{count} = 2{,}362261$ and $t_{table} = 1{,}672751$, so that $t_{count} < t_{table}$.

Keywords: Comparison, Dyadic Method Structure, Lecture Method, Brain Gym, Activity, Learning Outcomes.

INTRODUCTION

Learning is an everyday event at school. Learning is a complex thing. The complexity of learning can be seen from two subjects, namely from students and from teachers. In terms of students, learning is experienced as a process. Students experience mental processes in dealing with learning material. From the teacher's point of view, the learning process appears as learning behavior about something. The dynamics of learning that are internal, associated with an increase in the hierarchy of cognitive, affective, and psychomotor domains. Based on the results of observations made on November 12, 2015, in mathematics learning teachers only use the lecture method in delivering mathematical material. So, in the learning process the teacher as the center. The atmosphere of saturation in the learning process is also experienced by some students because the teacher only uses one method at each meeting, the lecture method.

The use of the Structure Dyadic Method and lecture method in combination with Brain Gym have not been applied in classroom learning to improve student learning outcomes. So researchers want to make observations of whether there is an influence between the two methods with student activity. From the description that has been submitted on the background of the problem, the following problems can be identified:

1. Students feel bored when the learning process so that students are less active in learning.
2. The learning method used by the teacher has not made students active
3. Student learning outcomes have not yet reached the minimum completeness criteria standard (KKM).

Based on the identification of the problem and considering the limitations of time and the ability of researchers and so as not to spread to other problems, this study is limited to the comparison of the Dyadic Method Structure and lecture method with a combination of lectures with a combination of Brain Gym on the activeness and learning outcomes of students of SMP Negeri 8 Yogyakarta in 2014/2015 teachings on the subject of transformation.

Based on the background of the problem, problem identification, problem limitation, then the problem formulation in this study is:

1. Is there a difference in learning using the Structure Dyadic Method method and lecture method with a combination of Brain Gym to the learning activities of Grade VII students of SMP Negeri 8 Yogyakarta?
2. Is there a difference in learning using the Structure Dyadic Method method and the lecture method with a combination of Brain Gym to the learning outcomes of Grade VII students of SMP Negeri 8 Yogyakarta?
3. Is learning with the Structure Dyadic Method better than the lecture method with the combination of Brain Gym on the activeness and learning outcomes of Grade VII students of SMP Negeri 8 Yogyakarta?

The objectives of this study are as follows:

1. To find out the differences in learning using the Structure Dyadic Method and lecture method with a combination of Brain Gym to the learning activeness of junior high school students in learning mathematics.
2. To determine the differences in learning using the Structure Dyadic Method and lecture method with a combination of Brain Gym on junior high school student learning outcomes in learning mathematics.
3. To find out which one is the better Structure Dyadic Method and lecture method with a combination of Brain Gym on the activeness and learning outcomes in mathematics learning.

METHODS

This type of research in this study is an experimental study using comparative research, which compares two different treatments in two different groups/samples. The place used as research is Yogyakarta State Junior High School 8, with research subjects being graded VII students even semester 2015/2016. The research was carried out in the even semester of the 2015/2016 school year.

In this study the population of class VII-F, VII-G, VII-H, and VII-I of SMP Negeri 8 Yogyakarta. The sampling technique of this study was carried out by random sampling by taking a random sample. The random sampling results are class VII-I as an experimental class (Structure Dyadic Method), class VII-F as an experimental class (Brain Gym), and class VII-H as an instrument trial class. The research variables in this study are the learning method, learning activeness and learning outcomes. Data collection is done by using the questionnaire method and the question method. Indicators of success are measured by changes in posttest score results, initial activity, and final activity. Analysis of student activeness data in learning using the formula:

$$P = \frac{nm}{N} \times 100\%$$

P = Percentage
nm = number of items checked list
N = the sum of all items

The results of the midterm and posttest were analyzed based on the planned scoring. The way to analyze cognitive assessment data has been determined, according to $M = \frac{\sum_{i=i}^{n} x}{N}$

M = mean (average value)
$\sum_{i=i}^{n} x$ = the total value obtained from the sum of the values of each individual
N = the number of individuals

The formula used for the normality test is the Chi-Square formula as follows:
H_0: Population is normally distributed
H_1: Population not normally distributed

$$\chi_0{}^2 = \sum_{i=1}^{k} \frac{(o_i - e_i)^2}{e_i}$$

$\chi_0{}^2$ =*chi squared*
o_i = the frequency of observations in the i-th interval
e_i = expectation frequency in the i-th interval
k = the number of interval classes
Where i = 1,2,..., k
Then reject H_0 if $\chi_0{}^2 > \chi_\alpha{}^2(k-1)$.
The formula used for the Homogeneity Test is the Bartlett Test.
$x^2 = \{ln10\}\{B - \sum_{i-1}^{k}(n_i - 1)\log S_i^2\}$
$B = (\log S^2)\sum_{i=1}^{k}(n_i - 1)$
$S^2 = \frac{\sum_{i=1}^{k}(n_i-1)S_i^2}{\sum_{i=1}^{k}(n_i-1)}$
Information :
n_i : the number of sample i
S^2 : i-th sample variance
B : number and degrees of freedom of the sample with combined logarithms and variances
$(\log S^2)$: logarithm and variance combined count
$\sum_{i=1}^{k}(n_i - 1)$: number of degrees of freedom i
Hypothesis Test the final data analysis that wants to test the difference between the two averages of the two samples of the variable under study, the statistical technique used is the t-test by testing the Two-Party Hypothesis Test
T-test statistics as follows:

$$\mathrm{t} = \frac{\bar{\mathrm{x}}_1 - \bar{\mathrm{x}}_2}{\mathrm{S}_{\mathrm{p}}\sqrt{\frac{1}{\mathrm{n}_1}+\frac{1}{\mathrm{n}_2}}}$$

where

$$S_p = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

RESULTS ADN DISCUSSION

Based on the results of the initial activeness questionnaire students of the Structure Dyadic Method experimental class and the lecture method with a combination of Brain Gym in SMP Negeri 8 Yogyakarta showed that the average percentage of student activeness scores showed that the average percentage of initial activeness scores reached 56.76% included insufficient qualifications.

The results of the final activity questionnaire in the Structure Dyadic Method experimental class and the lecture method in combination with Brain Gym in SMP Negeri 8 Yogyakarta showed the average percentage of students' activeness scores showing the average percentage of initial activeness scores reaching 75.7% included in good qualifications

Based on the results of the first-semester its grade Structure Dyadic Method experiment class and lecture method with a combination of Brain Gym in SMP Negeri 8 Yogyakarta. Completeness based on KKM which has been determined by the school that is 80. The following is a summary of data UTS and posttest value data:

Table 1. Summary of UTS Data Descriptions

Parameter	The Dyadic Method Structure experimental class	Brain Gym experimental class
The highest score	87,5	87,5
Lowest value	60	60
Average value	73,75	70,15
Standard deviation	8,01	11,02
Variance	64,16	121,44
Number of students who have completed	10	8

Table 2. Summary of Postest Data Descriptions

Parameter	The Dyadic Method Structure experimental class	Brain Gym experimental class
The highest score	100	100
Lowest value	60	60
Average value	85,23	78,64
Standard deviation	10,34	11,84
Variance	106,91	140,18
Number of students who have completed	25	15

Based on Table 1 and Table 2 there is an increase in the number of students who complete.

Test the normality of the initial activity of the experimental structure dyadic method $x^2_{stat} = 1{,}861189$ and x^2_{table} =7,815; $x^2_{stat} < x^2_{table}$, so the data is normally distributed. Whereas the normality test data for the final activity of the experimental class lecture method $x^2_{table} = 5{,}2207779$ and x^2_{table} =7,815; $x^2_{stat} < x^2_{table}$, so the data is normally distributed.

Test the normality of the final activity of the structure dyadic method experimental class $x^2_{stat} = 1{,}385406$ dan x^2_{table} =5,991 ;$x^2_{stat} < x^2_{table}$, so the data is normally distributed. Whereas the normality test data for the final activity of the experimental class lecture method $x^2_{stat} = 1{,}99239$ and x^2_{table} =5,991; $x^2_{stat} < x^2_{table}$, so the data is normally distributed.

Test the normality of the UTS class structure experimental dyadic method $x^2_{stat} = 0{,}578496$ and x^2_{table} =5,9915, $x^2_{stat} < x^2_{table}$, so the data is normally distributed. While the UTS normality test experimental class lecture method $x^2_{stat} = 0{,}693779$ and x^2_{table} =7,815, $x^2_{stat} < x^2_{table}$, so the data is normally distributed.

Test the posttest normality of the dyadic method structure experimental class $x^2_{stat} = 2{,}02$ and x^2_{table} =5,991; $x^2_{stat} < x^2_{table}$, so the data is normally distributed. While the posttest normality test is the experimental class lecture method $x^2_{stat} = 4{,}0994$ and x^2_{table} =7,815; $x^2_{stat} < x^2_{table}$, so the data is normally distributed.

Homogeneity test for initial activity $x^2_{stat} = 1{,}74296$ dan $x^2_{table} = 3{,}8415$; $x^2_{stat} < x^2_{table}$ so the data is homogeneous. Homogeneity test for final activity $x^2_{stat} = 0{,}14818$ and $x^2_{table} = 3{,}8415$; $x^2_{stat} < x^2_{table}$ so the data is homogeneous.

UTS homogeneity test $x^2_{stat} = 3{,}1$ and$x^2_{table} = 3{,}8415$; $x^2_{stat} < x^2_{table}$ so the data is homogeneous. Posttest homogeneity test $x^2_{stat} = 0{,}006595$ and $x^2_{table} = 3{,}8415$; $x^2_{stat} < x^2_{table}$ so the data is homogeneous.

The results of the activeness hypothesis test using the t-test can be seen in Table 3 and Table 4 below:

Table 3. Results of Calculation of Two-Party Hypothesis Test

t_{stat}	t_{table}	Significant Level	dk	Information
2,119216	2,002376	5%	58	H_0 rejected and H_1 accepted.

Liveliness $t_{stat} > t_{table}$ at a significant level of 5% and dk = 58, so H0 rejected and H1 accepted. In other words, there is a difference in activity between students who use the Dyadic Method Structure and lecture method with a combination of Brain Gym.

Table 4. Results of Calculation of One-Party Hypothesis Test

t_{stat}	t_{table}	Significant Level	dk	Information
2,119216	1,671969	5%	58	H_0 rejected and H_1 accepted.

Liveliness $t_{stat} > t_{table}$ at a significant level of 5% and dk = 58, so H_0 rejected and H_1 accepted. In other words, the Structure Dyadic Method method is better than the lecture method with a combination of Brain Gym in increasing student activity.

Hypothesis test results of learning outcomes using the t-test can be seen in Table 5 and Table 6 below:

Table 5. Results of Calculation of Two-Party Hypothesis Test

t_{stat}	t_{table}	Significant Level	dk	Information
2,362261	2,003602	5%	56	H_0 rejected and H_1 accepted.

Learning outcomes $t_{stat} > t_{table}$ at a significant level of 5% and dk = 56, so H_0 rejected and H_1 accepted. In other words, there are differences in learning outcomes between students who use the Structure Dyadic Method and lecture method with a combination of Brain Gym.

Table 6. Results of Calculations for the One-Party Hypothesis Test

t_{stat}	t_{table}	Significant Level	dk	Information
2,362261	1,672751	5%	56	H_0 rejected and H_1 accepted.

Learning outcomes $t_{stat} > t_{table}$ at a significant level of 5% and dk = 56, so H_0 rejected and H_1 accepted. In other words, the Dyadic Method Structure method is better than the lecture method in combination with Brain Gym.

CONCLUSION

1. There is a difference in the activeness of students who use the Dyadic Method Structure and the lecture method in combination with the Brain Gym.
2. There are differences in student learning outcomes using the Dyadic Method Structure and the lecture method in combination with the Brain Gym.
3. The Dyadic Method Structure Method is better than the lecture method with a combination of Brain Gym in increasing activity and learning outcomes.

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