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Effectiveness of Fleming Model Towards Mathematics Learning Achievement in Terms of Student's Learning Motivation of Grade VII Students of SMP Negeri 18 Buton Tengah

Minarni; Kana Hidayati

Science Faculty, Yogyakarta State University, Indonesia

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Abstract

The purpose of this study was to determine that the Fleming learning model is effective for mathematics learning achievement when viewed from the learning motivation of grade VII students of SMP Negeri 18 Central Buton. This research is an experimental research, which was conducted on grade VII B students as an experimental class and VII B as a control class at SMP Negeri 18 Buton Tengah, semester 2 of the 2018/2019 academic year. Data collection in this study was carried out using research instruments in the form of tests and questionnaire items to both groups, to measure student achievement and learning motivation on flat building material, especially triangles. The data obtained were analyzed by descriptive analysis and inferential analysis and hypothesis test in the form of ancova test. Based on the results of data analysis and discussion, it can be concluded that the Fleming learning model is not effective for mathematics learning achievement based on the learning motivation of grade VII students of SMP Negeri 18 Central Buton. However, when viewed from the influence of the learning model, the learning model affects learning achievement, this can be seen from the average student learning achievement before and after being treated, in the results of descriptive analysis of student learning achievement. Student learning motivation is high, but the learning motivation of experimental and control class students is the same, so there is no significant influence on student achievement.

Keywords: *Fleming Model; Mathematics; Learning Achivement; Learning Motivation*

Introduction

Education is always characterized by the existence of two main elements, namely teachers as parties who provide knowledge and students as parties who receive knowledge. However, if it is devoted to the notion of learning in a school environment, the elements will increase such as the necessity of formal elements, organization, goals, curriculum tools and others (Lidia, 2016:25).

Sardiman (2003:67) defines learning as the process of learning students using educational principles and learning theory. Learning is a process of communication between teacher to student or vice versa, as well as between students and students. In the learning process, the role of the teacher is not only to provide information, but also to direct, and provide learning facilities (Sudjana, 1988:98). The learning

process initially asks teachers to know the basic abilities possessed by students including basic abilities, motivation, academic background, and others. Knowing about student characteristics in learning is the most important thing in the delivery of teaching materials and is an indicator of successful learning implementation, therefore the use of the right learning model can help teachers to carry out effective learning (Towndrow & Soon, 2008:154).

Learning success is not only influenced by external factors, but also internal factors such as learning motivation. As'ari, dkk. (2017:132) suggests that motivation in learning is very important for students. If there is motivation in students, the learning process in class will be good and the goals will be achieved. Motivation can grow from within students or from other people. Meanwhile, according to Muhibbin (2007:138), if students have motivation, they will seriously show interest, have attention, very strong curiosity to participate in learning activities, try hard, and give enough time to do until the task is completed.

Based on observations of mathematics learning for class VII students of SMP Negeri 18 Buton Tengah, it was found that during the learning process students were less enthusiastic or motivated to take part in learning mathematics. This can be seen when the teacher delivers the material, students do not pay attention to the teacher, students play during the learning process, and there are still students working on individual assignments in groups. Student learning achievement is not good when viewed from the odd semester exam scores that do not reach the minimum completeness criteria (KKM).

The effectiveness of learning also depends on the learning model used by the teacher. The learning model used must be in accordance with the characteristics of students, and in accordance with the material being taught. The learning model can be an alternative to achieve good learning objectives in this case student learning motivation increases, so that student achievement also increases (Dimyati & Mudjiono 2009:112). One of the learning models that can be used is Fleming. Fleming was designed referring to the optimization of learning modalities which aims to make students feel comfortable in the learning process (Lidia, 2016:76). This is in accordance with the technique of learning mathematics, namely students feel happy and comfortable in learning mathematics, so that students' motivation and achievement in learning mathematics can be effective.

Research Methods

This study is an experimental study because it was conducted to determine whether or not there is an effect of a treatment imposed on subjects (Huitema, 1938:46). This study was conducted to determine the effectiveness of mathematics learning through the Fleming learning model on mathematics learning achievement in terms of student learning motivation. The design used in this study was "Posttest-Only Control Design". The independent variables in this study were Fleming's learning model and learning motivation. While the dependent variable is mathematics learning achievement. The design of this study is illustrated in the following table.

Table 1. Research Design

Class	Pretest	Treatment	Posttest	Questionnaire
E	Y_{E1}	T	Y_{E2}	M_E
K	Y_{K1}	V	Y_{K2}	M_K

Information:

E = Experimental class

K = Control class

T = Learning using Fleming

V = Learning using Problem Based Learning model

Y_{E1} = *Pretest* Experimental Class

Y_{K1}= *Pretest* control Class

Y_{E2}= *Posttest* experimental class
Y_{K2} = *Posttest* control class

M_E = Experimental class motivation questionnaire

M_K = Control class motivation questionnaire

Discussion and Results

Fleming's learning model was applied to the experimental class, namely class VII B and the conventional learning model in the control class, namely class VII A. The data in this study consisted of pre-test and post-test data. The collected research data is then analyzed with the following stages.

1. Descriptive Analysis

a. Results of Pre-Test Descriptive Analysis of Student Learning Achievement

The results of the descriptive analysis of the pre-test mathematics learning achievement of the experimental class are as follows:

Statistic		
N	Valid	22
	Missing	0
Mean		62.27
Median		60.00
Std. Deviation		7.516
Variance		56.494
Minimum		50
Maksimum		75

The average student achievement (pre-test) experimental class was 62.27, the median was 60.00, with a standard deviation of 7.516, variance of 56.494, a maximum score of 50, and a minimum score of 75.

While the results of the descriptive analysis of the pre-test of mathematics learning achievement in the control class are as follows:

N	Valid	20
	Missing	0
Mean		63.50
Median		62.50
Std. Deviation		7.797
Variance		60.789
Minimum		50
Maksimum		75

The average student achievement (pre-test) of the control class was 63.50, the median was 62.50, with a standard deviation of 7,797, a variance of 60,789, a maximum score of 50, and a minimum score of 75.

b. Results of Post-Test Descriptive Analysis of Student Learning Achievement

The results of the post-test descriptive analysis of experimental class students' learning achievement are as follows:

N	Valid	22
	Missing	0
Mean		86.59
Median		85.00
Std. Deviation		7.136
Variance		50.920
Minimum		75
Maksimum		100

The average student achievement (post-test) experimental class was 86.59, the median was 85.00, with a standard deviation of 7,136, variance of 50,920, a minimum score of 75, and a maximum score of 100.

While the results of the post-test descriptive analysis of learning achievement of control class students are as follows:

N	Valid	20
	Missing	0
Mean		77.00
Median		75.00
Std. Deviation		6.767
Variance		45.789
Minimum		65
Maksimum		90

The average student achievement (post-test) of the control class was 77.00, the median was 75.00, with a standard deviation of 6.767, variance of 45.789, a minimum score of 65, and a maximum score of 90.

c. Results of Descriptive Analysis of Learning Motivation Questionnaire

N	Valid	42
	Missing	0
Mean		84.40
Median		85.00
Std. Deviation		5.657
Variance		32.003
Minimum		72
Maksimum		96
TCR		76.73%

The average student achievement (post-test) of the control class was 84.40, the median was 85.00, with a standard deviation of 5,657, variance of 32,003, a minimum score of 72, and a maximum score of 96, the respondent's achievement score (TCR) was 76.73%, meaning that students' motivation to learn mathematics was high.

2. Inferential Analysis

a. Normality Test

Normality test using Kolmogorov-Sminorv Test with significance level (α) = 5%. This test is performed with the help of SPSS 22. The data is normally distributed if significant values > (α).

		Undstandardized Residual
N		42
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	8.36996579
Most Extreme Differences	Absolute	.097
	Positive	.097
	Negative	-.073
Test Statistic		.097
Asymp. Sig. (2-tailed)		.200[c,d]

The significant value obtained is > (α) 0.05 so that it can be concluded that student achievement data and motivation are normally distributed.

b. Homogeneity Test

The homogeneity test uses Levene's homogeneity test with significance level (α) = 5%.

	Levene Statistic	df1	df2	Sig.
Prestasi	1.306	1	40	.260
Motivasi	.286	1	40	.596

Based on the table above, it can be seen that student learning achievement has a significant value = 0.260 > 0.05, and student learning motivation has a significant value = 0.596 > 0.05. Therefore, it can be implied that the test data of achievement and learning motivation of experimental and control class students are homogeneous.

c. Hypotheisis Test

Hypothesis testing in this study uses the ancova test (response modifier by controlling for other quantitative variables). with the help of the SPSS 22 program with a significant level (α) = 5%.

Source	Type lll Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1286.843[a]	2	643.421	7.151	.002
Intercept	248.439	1	248.439	2.761	.105
C	60.782	1	60.782	.676	.416
F	1284.022	1	1284.022	14.271	.001
Error	3508.991	39	89.974		
Total	20225.000	42			
Corrected Total	4795.833	41			

Based on the table above, the results of the ancova test above can be seen in line F (learning model) that Fcalculate = 14.271 > 4.08 with a significant value = 0.001 < (α) (0.05) means, Fleming's learning model has an effect on learning achievement.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1295.524[a]	3	431.841	4.688	.007
Intercept	246.407	1	246.407	2.675	.110
F	.323	1	.323	.004	.953
C	60.344	1	60.344	.655	.423
F * C	8.681	1	8.681	.094	.761
Error	3500.309	38	92.113		
Total	20225.000	42			
Corrected Total	4795.833	41			

Based on the table above, after being viewed together, the influence of the model and motivation as covariance, has no effect on student achievement, where the value of sig = 0.761 > 0.05. So it can be concluded that Ho is accepted and H1 is rejected.

This means that mathematics learning through the Fleming learning model is not effective for learning achievement in terms of the learning motivation of grade VII students of SMP Negeri 18 Central Buton. However, if learning achievement is seen from the influence of learning models on student learning achievement, the Fleming learning model is more effective than conventional learning models. This can be seen from the difference in the average learning achievement of experimental and control class students.

Based on the results of descriptive analysis, the average results of the Pre-Test and Post-Test experimental class were higher than those of the control class. The results obtained the Pre-Test score of the experimental class was 62.27 and the control class with a value of 63.50. Then the average Post-test score of the experimental class was 86.59 and the control class with a value of 77.00. By looking at the average increase in Pre-Test and Post-Test tests in experimental classes, learning using the Fleming model is said to be effective in increasing student achievement. While the motivation data obtained an average value of 84.40, and the percentage of student learning motivation of 76.73% is included in the high motivation category.

Based on the results of the variance normality test using the Kolmogorov-Sumirnov test, student achievement and learning motivation data appear to be > test results of 0.05. Then it can be said that the experimental class and the control class are normally distributed. For the homogeneity test results of achievement data and learning motivation of experimental and control class students > 0.05, this means that both variances are homogeneous or equal.

Based on the results of the ancova test, it appears that fcalculate = 14.271 > 4.08 with a significant value = 0.001 < (α) (0.05) so that it is concluded that Ho is accepted and H1 is rejected. This means that mathematics learning through the Fleming learning model is not effective for mathematics learning achievement in terms of the learning motivation of grade VII students of SMP Negeri 18 Central Buton. However, when viewed from the influence of the learning model, the Fleming learning model (experimental class) is more effective than the conventional learning model (control class), this can be seen in the average value of student learning achievement before and after being given treatment.

The ancova test shows that from the results of student achievement in experimental classes and control classes when viewed from student learning motivation, there is no influence of motivation on student learning achievement. But when viewed from the learning model, the Fleming learning model affects learning achievement. As well as the Fleming learning model is more effective than conventional learning models, this can be seen from the average learning outcomes of students before and after being treated.

Conclusion and Suggestions

Based on the results of data analysis and discussion, it can be concluded that the Fleming learning model is not effective for mathematics learning achievement based on the learning motivation of grade VII students of SMP Negeri 18 Central Buton. However, when viewed from the influence of the learning model, the learning model affects learning achievement, this can be seen from the average student learning achievement before and after being treated, in the results of descriptive analysis of student learning achievement. Student learning motivation is high, but the learning motivation of experimental and control class students is the same, so there is no significant influence on student achievement.

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