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The influence of diversity in learning strategies and various motivations for conceptual understanding

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Abstract

The purpose of this research is to see: 1) Knowing the mathematics learning outcomes of integer material with a direct learning model and using problem-based learning strategies. 2) the influence of mathematics learning outcomes with high and low motivation which is treated using problem-based learning models and direct learning. 3) The interaction between the problem-based learning model and the direct learning model, as well as students' learning motivation towards the mathematics learning outcomes of integer material. This research is a quantitative study by determining the sample using random sampling technique. This research is a quantitative study by determining the sample using random sampling technique. The number of samples for the control class was 52 students and the experimental class was 52 students, so the sample size was 104 students. Data collection was carried out using test questions and motivation questionnaires, with testing using the 2-way ANOVA test statistic. Retrieval of data using test questions and motivation questionnaires, using the 2-line ANOVA statistical test. The results of the study are as follows: 1) There is an influence on the results of learning mathematics using the Problem Based Learning model and direct learning model. 2) There is an effect of mathematics learning outcomes of seventh grade junior high school students between groups of students who have high learning motivation and low learning motivation. 3) The interaction between the Problem Based Learning model and the direct learning model with students' learning motivation towards Mathematics learning outcomes.

Keywords: Problem-based learning, direct, motivation diversity, learning outcomes.

Introduction

Creative problem solving is a problem-based learning strategy created for creative problem-solving. Creativity expresses the problem given, discussed, and the discovery of ideas. Creative problem solving can be determined as a skill to achieve the goals needed through the creative process to find new and creative solutions (Kumar, 2019; Suryanto, Degeng, Djatmika, & Kuswandi, 2020). several things that can improve the quality of education in Indonesia.. Among other things, by improving the learning system conducted by teachers. Teachers can use several learning methods that can improve students' understanding of one particular basic competency, as the use of varied methods provides more benefits to students. The success of Mathematics learning can be measured by the success of students who participate in these learning activities. The success can be seen from the level of understanding, motivation, mastery of materials, as well as student learning outcomes. The higher the understanding and mastery of materials and learning outcomes, the higher the success rate of learning.

That is, it is not sufficient for education systems to ‘pass the buck‘ for educational improvement to teachers and construe the school as simply the location of teachers’ work. It is important to understand the nature of the school as an organization that structures, enables and/or constrains educational work. The responsibilities of ‘the school’ for improving the educational opportunities afforded to its students must also be understood as being greater than the aggregated responsibilities of the individual teachers who are part of the unit (Grundy, 1994). epistemological point of view, that is, as a representation of learning and the

process of gaining new knowledge. I will argue that in the light of the philosophical studies on the ways of gaining new knowledge of the world, the model of experiential learning is inadequate. Through its humanistic connection, the concept of experience also has an ideological function: faith in an individual's innate capacity to grow and learn. This is what makes it particularly attractive for adult education theorists and for the idea of life- long learning. The humanistic connection is also epistemologically significant since it strengthens the methodological individualism of experiential learning (Academy et al., 2005).

The math study results of SMP Negeri 2 Lamongan students averaged 71 and SMPN 1 Turi was 68, and this means that it is still below the minimum completion criteria (KKM) as determined by the school in question, which is 80 for SMP Negeri 2 Lamongan and KKM of 75 for SMPN 1 Turi. This is influenced by factors that in mathematics learning, among others, in following the learning still does not appear active, students rarely ask questions, although teachers often give opportunities to students to ask about things that are not understood, activeness in working on practice questions in the learning process that is still lacking, One of the educational activities to improve knowledge is to improve the teacher's learning how to stimulate and carry out learning effectively and efficiently.

Method

The research started from theoretical studies, describing the development of theory into learning using problem-based learning, direct learning models and learning outcomes, thought frameworks, and hypotheses. Where the research began with the compiler of the developed grid is a test, both creativity tests, and study results tests,, the research subjects are SMP Negeri 2 Lamongan and SMPN 1 Turi,, Providing post-tests to measure the results of learning in experimental groups and control groups,, Using statistic anava 2 paths to analyze research data. Samples at SMP Negeri 2 Lamongan grade VII A and grade VII B as many as 56 students, in SMPN 1 Turi grade VII A and class VII B as many as 48 students. Thus the sample in this study amounted to 104 students. From both classes, researchers conducted a draw in order to establish experimental groups and control groups. Researchers use several data collection techniques, among others, Observation, Documentation, Questionnaires, Tests, Interviews. Before testing the hypothesis, first, the data normality test and data homogeneity test are carried out by doing where the normality test is used to find out whether the data used in this study is normally distributed or not. To determine the normality of the data the Kolmogorov Smirnov test was performed. The basic concept is to compare the distribution of data (which will be tested for normality) with the raw distribution. At the same time, test homogeneity is used to know which group the average difference does not differ significantly and significantly. Homogeneity test variant post-test field of study Mathematics principal Integer Class VII SMP Negeri 2 Lamongan and SMPN 1 Turi compared to the formula test F namely:

Largest V = Largest variant

Smallest V = Smallest variant

Learning Activity 1 at SMPN 2 Lamongan was held on Wednesday, August 27, 2014, with an allocation of 2 hours of lessons (2 x 40'). The learning materials taught are integers using a Problem-based learning model. In the experimental class that delivers the material is the researcher.

Learning Activity 1 at SMPN 1 Turi was held on Thursday, August 28, 2014, with an allocation of 2 hours of lessons (2 x 40'). The learning materials taught are integers using a Problem-based learning model. After the learning is completed at the next meeting, the researchers give *a post-test* in the form of multiple-choice questions and a questionnaire of students' motivation to the lesson that must be filled by students on September 6, 2014.

Results

Experiment class 1 has a value range between 60 to 90 so that the range (range) is 30, with an average value (mean) of 75.00 and a median of 75.00 while the standard deviation is 6.67. Control Class-1 has a range of values from 55 to 80, with an average mean of 68,571 and a median of 70.0, while a standard deviation of

6,362. Experiment Class-2 has a value range of 60 to 90, with an average mean of 75,208 and a median of 75.0 while a standard deviation of 7.44241. Control Class-2 has a range of 55 to 85, with an average mean of 69,792 and a median of 70.00 while a standard deviation of 7.2949. Experiment Class-1 motivation ranges from 73 to 100, with an average mean of 86.46 and a median of 88.00. Motivation to Learn Control Class-1 has a range of 76 to 91, with an average score (mean) of 85.3571 and a median of 87.00. Motivation to Study Experimental Class-2 has a range of 81 to 94 with an average score (mean) of 88.33 and a median of 90.00. Motivational Learning Control Class-2 has a range of 78 to 92, with an average value (mean) of 86,708 and a middle value of 87.50.

Normality test results

Normality tests are used to determine whether the data on learning outcomes obtained and analyzed come from normally distributed data. The normality test was conducted using liliefors test technique (Kolmogorof-Smirnov Wilks).

Table 1 Normality test

		A Kolmogorov-Smirnov			Shapiro-Wilk		
	Class	Statistics	Df	Sig.	Statistics	Df	Sig.
Value	experiment class1	.143	28	.150	.956	28	.274
	Control Class 1	.160	28	.063	.944	28	.142
	experimental class2	.156	24	.138	.962	24	.487
	control class2	.137	24	.200*	.963	24	.492

Source : data normality test calculation result

Based on the table above it appears that the results of the normality test data of experimental class 1 learning level of significance (sign.) of 0.150, 2 experimental class of significance (sign.) of 0.138 control class 1 level of significance (sign.) of 0.063, control class 2 level of significance (sign.) of 0.200, so that the entire class shows the level of significance (sign.) above 0.05 (5%). Because the level of significance is above 0.05 (5%), then the result means rejecting the assumption that the distribution of data is not normal. So it can be concluded that the results of the normality test show that the distribution of learning outcome data is normal.

Table 2 Homogeneity test results

Lavene's test results are as follows:

Levene Statistic	df1	df2	Sig.
.170	3	100	.916

Source : Homogeneity Test Calculation Result

Based on the results of lavene's test analysis, it is known that the variance of the data of the entire class is homogeneous.

Table 3 Validity test results

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Criteria (r table =0.1622)	Conclusion
problem1	93.4615	385.183	.219	.304	r count > r table	Valid
soal2	93.3654	381.283	.501	.296	r count > r table	Valid
problem3	93.3942	385.484	.221	.304	r count > r table	Valid
problem4	93.3654	385.613	.225	.304	r count > r table	Valid
problem5	93.3365	381.526	.517	.296	r count > r table	Valid
soal6	93.3654	384.195	.315	.302	r count > r table	Valid
soal7	93.4327	381.238	.454	.296	r count > r table	Valid
soal8	93.4038	382.845	.376	.299	r count > r table	Valid
soal9	93.3750	383.324	.364	.300	r count > r table	Valid
problem10	93.4327	382.151	.401	.298	r count > r table	Valid
question11	93.3654	382.681	.412	.299	r count > r table	Valid
problem12	93.4231	383.858	.306	.301	r count > r table	Valid
soal13	93.3750	382.275	.430	.298	r count > r table	Valid
problem14	93.3846	382.666	.398	.299	r count > r table	Valid
soal15	93.3654	385.147	.255	.303	r count > r table	Valid
problem16	93.3846	384.744	.270	.303	r count > r table	Valid
soal17	93.3365	380.361	.596	.294	r count > r table	Valid
problem18	93.3365	382.323	.462	.298	r count > r table	Valid
problem19	93.3365	380.361	.596	.294	r count > r table	Valid
soal20	93.3269	383.814	.370	.301	r count > r table	Valid

Table 4 Reliability test results

Cronbach's Alpha	N of Items
.724	20

Source : Reliability Test Calculation Results

Nilai *Alpha Cronbach* is 0.724, which is greater than 0.60, which means it can be concluded that the test instrument used is reliable and acceptable.

Tabel 5 Variance Analysis Results (Anava) 2-line

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	4996,074[a]	32	156.127	15.009	.000
Intercept	295171.954	1	295171.954	2,838E4	.000
x1	178.012	1	178.012	17.113	.000
x2	3773.672	19	198.614	19.094	.000
x1 * x2	265.525	12	22.127	2.127	.025
Error	738.542	71	10.402		
Total	546600.000	104			
Corrected Total	5734.615	103			

R Squared = .871 (Adjusted R Squared = .813)
Source : Calculation Result of 2-Line Variant Analysis

Discussion

The results of the analysis (F_{count})between the treatment of the Learning Model (X_1)are known to be = 17,113, with a degree of significance (sign.) = 0.000. Because the significance level is smaller than 0.05 (5%), the result is significant. The results of the analysis (F_{count})between the treatment of Learning Motivation (X_2)are known to be = 19,094, with a degree of significance (sign.) = 0.000. Because the significance level is smaller than 0.05 (5%), the result is significant. The results of the analysis (F_{count})between the treatment of learning models and learning motivation ($X_1 * X_2$)are known to be = 2,127,with a significant level = 0.025. Because the significance level is smaller than 0.05 (5%), the result is significant.

Inferred

Based on the results of the analysis as outlined in the previous chapter, the author can provide the following conclusions: (1) There is an influence of learning outcomes between students who are taught using problem-based learning models and direct learning models in mathematics subjects of Integer material at SMP Negeri 2 Lamongan and SMPN 1 Turi. The average score of learning outcomes showed that students treated with the Problem-Based Learning Model scored higher on average compared to the Direct Learning Model. (2) There is an influence of learning outcomes between students who have high learning motivation and those who have low learning motivation on Problem-Based learning and Direct learning at SMP Negeri 2 Lamongan and SMPN 1 Turi. (3) There is an interaction between the learning model and the motivation of students' learning on the results of mathematics subjects in Grade VII students at SMP Negeri 2 Lamongan and SMPN 1 Turi means that the interaction of learning models and learning motivations have a significant influence on learning outcomes.

Conclusion

Based on the conclusion of the research results as mentioned above, researchers advise (1) To Teachers should be able to control the direction of discussion of each problem so that teachers are required to be more active. (2) The principal should socialize with teachers in order to develop the use of Problem-Based learning models, especially in Mathematics subjects, (3) The principal should brief the teachers so that in the teaching and learning process, they not only deliver materials but, more importantly, create pleasant learning conditions so that high learning outcomes can be obtained. (4) The school is advised to provide the necessary facilities and infrastructure in Problem-Based learning so that in learning can be effective and efficient so as to influence the results of mathematics learning.

Reference

.Academy, I., Clow, D., Conole, G., Dyke, M., Oliver, M., Seale, J., … Weiler, A. (2005). the Theme of "Relevance" in Third World. *Teaching and Teacher Education*, *1*(1), 46–53. https://doi.org/10.1080/026013700293458

Abdurrahman, M. 2009. *Education For Children With Learning Difficulties.* Jakarta: PT Rineka Cipta.

Abdurrahman, M. and Bintoro. 2010. *Understanding and Dealing with Students with Learning Problems: Teacher's Guide.* Jakarta: Jss Quality Improvement Project, Directorate of Public Secondary Education, Directorate General of Watershed and Secondary Education, Ministry of National Education.

Ani, Tri C. 2009. *Psychology Learning.* Semarang: UPT UNNES Press

Aqib, Zainal. 2010. *Propesionalism of Teachers In Learning*. Surabaya: Insan Cendikia.

Arikunto, Suharsimi. 2010. *Research Procedure of a Practical Approach.* Jakarta: Rineka Cipta.

Budiarto et al, 2004. *Wawawsan Mathematics Education.* Jakarta: Part of the System Development and Program Control project.

Djamarah, Syaiful Bahri and Aswan Zain. 2002. *Teaching and Learning Strategy.* Jakarta: Rineka Cipta.

Grundy, S. (1994). Action Research at the School Level: Possibilities and problems. *Educational Action Research*, *2*(1), 23–37. https://doi.org/10.1080/09650799400200007

Kumar, A. (2019). Cultures of learning in developing education systems: Government and NGO classrooms in India. *International Journal of Educational Research*, *95*, 76–89. https://doi.org/10.1016/j.ijer.2019.02.009

Kerami, Djati and Cormentyna Sitanggang. 2010. *Mathematics Dictionary.* Jakarta: Balai Pustaka.

Lambas et al, 2004. *Learning interaction and classroom management.* Jakarta: Part of jss program system development and control project.

Iskandar Wiryokusumo.2009.P*engantar Quantitative Research Method,*Surabaya; Unesa University Press

Nuharini, D. Wahyuni, T. 2008. *Math Concepts and Applications* 2. Ministry of National Education.

Nurhadi et al. 2010. *Contextual Teaching and Learning (CTL) and Its Application in KBK.* Revised Edition. Malang: Publisher of Malang State University.

Riduwan.2008. *Easy Learning Research For Teachers-Employees and novice researchers,Bandung:Alfabeta*

Rooijakkers, Ad. 2011. *Teaching Successfully.* Jakarta: PT Grasindo

Sardiman A.M.2010,*Interaction and Motivation of Teaching and Learning,*Jakarta:Rajawali Pers

Santyasa, I Wayan. 2007. *Innovative Learning Models.* Papers in PTK Training for Teachers

Suryanto, H., Degeng, N. S., Djatmika, E. T., & Kuswandi, D. (2020). The Effect of Creative Problem Solving Learning Strategy on Conceptual and Procedural Understanding Moderated by Social Skills. In *International Journal of Innovation, Creativity and Change. www.ijicc.net* (Vol. 13). Retrieved from www.ijicc.net