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Problem Based Learning Model to Increase Junior High School Students Achievement Motivation

Gunarti Sukriyatun, Endin Mujahidin, Hendri Tanjung

Universitas Ibn Khaldun Bogor, Indonesia

gunartisukriyatun@gmail.com, endin.mujahidin@uika-bogor.ac.id,
hendri.tanjung@uika-bogor.ac.id

Abstract. This research aims: 1) to determine current achievement motivation junior high school students in Bogor City. 2) to develop Problem Based Learning model to improve students of junior high school in Bogor City. 3) to determine the effectiveness of PBL model in improving students of junior high school achievement motivation and innovation in Bogor City. This research is based on the development research by Borg and Gall with three research and development stages, preliminary study, model development, and model test. The data analysis used during the development research were descriptive analysis, model validation analysis, and model effectiveness analysis with t-test independent samples. The results of the research concluded that: the achievement motivation and innovation of junior high school students in Bogor City is currently low and needs to be improved; the developed model is declared "fit for use" by learning experts with more notes. The PBL model is declared effective in increasing the achievement motivation students for junior high school in Bogor City.

Keywords. Motivation, model, Problem Based Learning

Introduction

Schools in facing the global challenges of the 21st century have prepared various learning and management models. The school holds a bilingual-based and course credit (SKS) program launched so that students get academic and non-academic achievements internationally (Depdiknas, 2007). Scientific reasoning is one of the higher order thinking skills and also included in the skills of the 21st century. Duschl, Schweingruber, and Shouse, (2007) explain that students who have high scientific reasoning will have good problem solving abilities.

McClelland state that the importance of the need for achievement, because people who are successful in business and industry are people who succeed in getting things done (McClelland, 1961, p. 21) Achievement motivation is about cultivating human capital, the challenge is not in the work, but in people who creating and managing work environments (Bruce, 2003, p. 9). According to John Maxwell, America's leading author, the essence of effective leadership is persuading others to follow the lead (Baldoni, 2004, p. 8)

Murphy and Alexander (2000, p. 317) explain that achievement motivation is an internal process that activates, guides, and maintains over time. Achievement motivation is a change in

energy in oneself (personal) which is characterized by the emergence of feelings and reactions to achieve goals. Motivation can be achieved from within oneself or from others. With motivation, someone can do something enthusiastically.

Morrison (1962, p. 137) states that achievement motivation indicators consist of; hard work, never give up, passion, and commitment. Meanwhile, (Sutianah, 2020, p. 34) states that the indicators of achievement motivation are; hard work, never give up, high spirit, and commitment.

In accordance with the Morrison statement that indicators of achievement motivation are clearly reflected in the personality of the Muhammad SAW in carrying out his duties as an Apostle the Prophet often encountered obstacles or problems when da'wah, but the figure of the Prophet who was full of enthusiasm and high commitment in conveying the religion of Allah so that he was able to complete it with good results. Allah SWT gave the concept of strategy to the Prophet Muhammad SAW in order to reach the Da'wah target. The concept includes three methods, as stated in the letter An-Nahl verse 125, namely the *alhikmah*, *almau'izahal hasanah*, and *almujadalah billatihiya ahsan*.

“Call to the Way of your Lord (to the Way that makes all to reach Allah, to Sıratı Mustakîm-the Path directed to Allah) with wisdom and good advice. Struggle with them in the best manner. Surely your Lord best knows those who go astray (those who fall into Misguidance) from His Way (His Sıratı Mustakîm-the Path directed to Allah) and He knows best those who reach Hidayet” (An-Nahl 125).

Activity to increase teacher pedagogical competence have been carried out in various ways, but have not produced optimal results. Based on observations on teacher supervision in the classroom, it was found that 65% of lectures, 20% of assignments and 15% of questions and answers were found. Learning is still centered on the teacher (teacher center), not yet centered on students (student center) so that learning is not fun for students.

The results of preliminary research using a questionnaire on achievement motivation on 116 students of Islamic Religious Education in Bogor City showed that students' achievement motivation in Islamic religious education subjects was still in the "low" category. Barell (2007, p. 3) states that Problem Based Learning (PBL) is a process of looking for information to solve problems, curiosity, doubt, and uncertainty about complex phenomena in life. In the Problem Based Learning (PBL) model students solve challenging problems so that student-centered learning.

Problem Based Learning (PBL) supposed can increase student achievement motivation. The results of other studies explain that PBL implemented in the classroom increases the innovation of solving various problems and increases the achievement motivation of high school students.

Other studies explain that PBL has a positive impact on the development of students' critical thinking so that students improve achievement, while the results of Abdullah and Azmi's research (2016, p. 256) show that problem-based learning is useful in teaching and improving critical thinking skills. Therefore, the authors conducted research on the development of PBL learning models to increase the achievement motivation of junior high school students in the city of Bogor.

Research Methodology

General Background

This study was a development research (R&D). Development research refers to the Borg and Gall research process. In general, the research and development process are divided into three process, 1) preliminary study, 2) model development, and 3) model testing.

Sample

The preliminary process consists of research and information collecting used to answer the first problem formulation, namely: How is the achievement motivation of Bogor City Junior High School students today? In this process, the researcher gave a questionnaire on achievement motivation, especially Islamic religious education subjects in Bogor City Junior High School.

This study uses sample of 32 students, the achievement motivation questionnaire instrument with $N = 32$ obtained a value of 0.349. From the results of the validity test below, it can be seen that of the 20 statement items, a significance value (2-tailed) is smaller than 0.05 so that all statement items are valid

Instrument and Procedures

The development process consists of developing assessment instruments, instructional strategy, and selecting instructional materials, design and conduct formative evaluation and revise instructions. The process are supposed to produce the model needed to answer the problems in the preliminary study.

The model test is the last process of R&D research which consists of design and conduct summative evaluation. The process of testing how the effectiveness of the PBL model in increasing the achievement motivation of Bogor Junior High School students. This process is a broad-scale test to measure the effectiveness of the PBL model on the achievement motivation of Bogor City Junior High School students.

The implementation of operational field testing process is focused on real learning. Learning tools that have been revised at the individual test and limited test are the main material at this process.

The achievement motivation instrument must be ensured to be valid and reliable. Validity is measured using the product moment correlation formula :

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Description:

r_{xy} = correlation coefficient between X variable and Y variable, the two correlated variables

N = number of subjects

X = item score per number

Y = fixed score

Data Analysis

The research subjects in the testing phase were taken purposively, with the consideration that the experimental group determined by the researcher had gone through the consideration that the students had the same characteristics and had met the requirements

determined by the researcher. Of the 12 schools selected, there were 4 junior high schools that were the initial research targets. There are SMPN 16, SMPN 19, SMPN 20 as the experimental group, and SMPN 14 as the control group.

Research Results

This study uses sample of 32 students, the achievement motivation questionnaire instrument with N = 32 obtained a value of 0.349. From the results of the validity test below, it can be seen that of the 20 statement items, a significance value (2-tailed) is smaller than 0.05 so that all statement items are valid.

Reliability test

The technique used to test reliability is Cronbach's Alpha coefficient. Cronbach's Alpha coefficient that is close to 1 indicates high consistency reliability. Cronbach's Alpha reliability coefficient of less than 0.6 indicates poor reliability. Reliability can be said to be reliable if the Cronbach's Alpha value is greater than 0.6. The test results are as in Table 1.

Table 1

Result Reliability Test

Variable	Cronbach- α	Critical Score	Description
Achievement Motivation	0,889	0,60	Reliable

The table shows that variables have Cronbach's Alpha values > 0.6 . The results of the reliability test of the achievement motivation variable questionnaire showed a value of 0.889. This means that this item provides a reliable indication.

Preliminary Study Results

The results of the initial research using the achievement motivation questionnaire instrument that has been tested for validity and reliability is presented in table 2.

Table 2

Result Reliability Test

No	School	Hard Work	Never Give Up	Spirit	Commmtment
1	SMPN 14	58	62	50	58
2	SMPN 16	54	61	54	57
3	SMPN 19	56	59	52	54
4	SMPN 20	56	58	52	55
Total		56	60	52	56

Table 2 shows that the average value of achievement motivation is 56.0 with the indicator value of hard work 56, never giving up 60, high spirit 52, and having commitment 56. The assessment standard of minimum completeness according to Minister of Education Regulation (*Permendikbud*) number 23 of 2016 is 75. This results show that achievement motivation is still in the "less" category.

Development

The results of the development of the assessment instrument consist of: (a) a grid of achievement motivation instruments (b) A grid (kisi-kisi) innovation. (c) Achievement motivation questionnaire. (d) Innovation questionnaire. The instrument grid (Kisi-kisi) is used to guide the preparation of the instrument. The results of the development of instructional strategy learning models whose contents consist of assignments with predetermined characteristics of competencies that must be achieved. At the beginning of the activity, the competencies that will be produced are determined.

Participants were assigned group assignments. In its implementation, it is assigned to be accompanied by motivation to be challenged to achieve. Participants need to be accompanied so that they can set goals, develop, and present their good result. These characteristics are the PBL learning and it was developed.

The implementation of PBL model learning activities needs to be set up consisting of a learning implementation guide and lesson plan (RP). Learning guides are prepared as a reference for education providers and all parties involved in implementing learning.

The results of the development in the form of lesson plans (RPP), syllabus, and Islamic religious education learning guidebooks for junior high schools were validated by learning experts, design experts, and linguists. In the validation process, learning experts look at the content and structure of manuals, lesson plans and syllabus, linguists look at grammar, use periods, semicolons, punctuation marks and others. Media experts look at the layout of the drawings, design pictures, etc. The results of the expert assessments all state that they are suitable for use with some input from learning experts, namely: at the beginning of learning so that the competencies to be achieved are explicitly stated. The order of learning/assignment is from simple to complex, from easy to difficult.

Respond to this recommendation, the type and size of the font used in the guide was improved. Improvements were made by equating the choice of font type used to "Times New Roman" and font size 12. The equalization improved the appearance of the guide and added to the convenience of the reader. The color of the image, the order of learning is also fixed.

Effectiveness Test

Before testing the effectiveness of the achievement motivation and innovation instrument, data prerequisite tests were conducted, which are the normality test and homogeneity test.

Normality test:

Normality test results are declared normal Normality test using the method

Lilliefors/Kolmogorov-Smirnov

By taking tolerance(α)=5%

Hypothesis:

H_0 : the sample comes from a normally distributed population

H_1 : the sample does not come from a normally distributed population.

Test statistics:

$L = \text{Max}|F(z_i) - S(z_i)|$

With

$F(z_i) = P(Z \leq z_i); Z \sim N(0,1)$

$S(z_i) =$ the proportion of the number of $Z \leq z_i$ over all z

The main areas for this test are:

$DK = \{L > L_\alpha; n\}$ where n is the sample size

0 accepted if Lobs are not DK members

Calculations with Statistical Package for the Social Sciences (SPSS) normality test results for achievement motivation are presented in table 3 below:

Table 3
Normality Test

	Kolmogorof-Smirnov		Shapiro-Wilk		
	Statistic	DfSig	Statistic	Df	Sig
Achievement Motivation	,089	234,000	,972	234	

The results of table 3 the motivational normality test have = 0.089 (sig.: 0.000) sig < 0.05, so that the test decision 0 is accepted, it can be said that the sample comes from a normally distributed population.

Homogeneity test:

Homogeneity test was conducted to find out whether the data had homogeneous variance or not. The homogeneity test in this study was carried out using the Levene Test. The hypotheses used in the homogeneity test are:

H₀: homogeneous data variance

H₁: data variance is not homogeneous

The data shows to be homogeneous if the resulting significance value is more than 0.05. The results of the homogeneity test with the Statistical Package for the Social Sciences (SPSS) of achievement motivation are presented in table 4 below :

Table 4
Test of Homogeneity Achievement Motivation Variable

		Levene Statistic	df1	df2	Sig.
Motivasi berprestasi	Based on Mean	,139	1	116	,710
	Based on Median	,103	1	116	,749
	Based on Median and with adjusted df	,103	1	112,272	,749
	Based on trimmed mean	,130	1	116	,720

Based on Table 6 above, Levene's value is 0.139 with sig: 0.710, then (p) 0.05, it concludes that each group has a population with the same variance (homogeneous).

Effectiveness Hypothesis Test:

The statistical hypotheses to be tested in this study are as follows:

Hypothesis: H₀: A₁=μA₂ (there is no difference in the mean achievement motivation of students with the PBL model compared to the conventional model)

H₁: A₁≠ A₂ (there is a difference in the average achievement motivation of students with the model PBL compared to conventional models)

Test Statistics

Independent sample t-test test formula (t-test):

$$t = \frac{\bar{D}}{\sqrt{\frac{d^2}{N(N-1)}}}$$

D: is the average score/value of group i.
N: is the number of respondents in group i
d : is the variance of group score i

The calculation is assisted by the SPSS 25.0 for Windows statistical program for the calculation of hypothesis testing, provided that if the significance value of t is 0.05, then H_0 is rejected, meaning that there is a difference in the average achievement motivation of students with the PBL model compared to the conventional model. The results of the independence test of the experimental group and the control group using SPSS are presented in Table 5 below:

Table 5
Sample t-test Achievement Motivation

t	df	Sig.(2-tailed)	t-test for Equality of Means			
			Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
2,014	116	,046	3,924	1,948	,065	7,783
2,130	62,285	,037	3,924	1,843	,242	7,607

It seen that the calculation results of hypothesis testing after being given treatment obtained t count: 2.014 (sig. 0.046) because < 0.05 then H_0 is rejected, which means that there is an average difference between the 2 sample classes. So it can be concluded that the achievement motivation with the PBL model is significantly better than the achievement motivation of students with conventional learning at the junior high school in Bogor City.

Discussion

Preliminary research results show the average value of achievement motivation is 56.0, the average value of innovation is 55.0. These results indicate that students' achievement motivation is still in the "low" category. The need for learning models that can increase hard work, enthusiasm, never give up, have commitment, produce something that has a characteristic, have ideas, have goals, and have a plan. The development of learning models pays attention to at least two main issues, namely topic selection and topic organization. The selected learning topics should be in the form of assignments that can increase hard work, enthusiasm, never give up, and have commitment.

The result of instructional development is a learning model that can increase student achievement motivation and innovation. The learning model is equipped with a device consisting of a learning implementation guide, syllabus, lesson plans (RP), and books of teaching materials. The learning guide is prepared as a reference for education providers and all parties involved in the implementation of learning. The learning guide is prepared based on the syllabus and lesson plan (RP). The syllabus is a set of plans and arrangements for the implementation of learning and assessment which are arranged systematically.

The assessment instrument is structured to measure the learning achievement of participants. This is in accordance with the opinion of Sugiyono (2012, p. 204) which explains that a good instrument can distinguish who excellent participants and do not. Systematic learning equipped with instruments of various learning models can make it easier for participants to understand learning. This is in accordance with the opinion of Schunk (2009, p.48) which states that in order for students to be able to easily understand the lesson, teachers

need to use teaching aids, and learning models that are in accordance with the development of students.

Application of PBL learning model significantly increases achievement motivation compared to conventional learning in PAI subjects for junior high school students in Bogor. This is in accordance with the opinion of Ward & Lee (2020, p. 20) which states that a learning model that involves students to solve a problem through the stages of the scientific method so that students can learn knowledge related to the problem and at the same time have the skills to solve problems. Likewise, the results of research by Fodor & Smith (2018, p. 208) state that achievement motivation that is carried out regularly can refresh the mind, increase motivation, work hard, and remain enthusiastic about having ideas to solve problems.

Conclusions and Implications

From the description above there are several things that can be concluded. First, the results of preliminary research on the achievement motivation of junior high school students are still low. Second, the development of the PBL model can increase the achievement motivation of junior high school students in Bogor City. Third, the PBL model is effective in increasing the achievement motivation of junior high school in Bogor City. These conclusions have several implications. The conclusion of the first study implies that every development of a training model should go through a need assessment or need analysis process. The need for learning models that can increase hard work, enthusiasm, spirit, and commitment. The conclusion of the second study implies that the development of a research model or learning model needs to involve expert assessment and a series of field trials in order to produce an appropriate and accountable model. The third research conclusion implies that to increase achievement motivation and innovation, it is necessary to choose a learning model that contains the following elements: (a) Preparation consisting of: determining the competencies to be achieved, and explaining and preparing the infrastructure used. (b) Implementation consists of: goal setting (setting goals to be achieved), group support (motivating each other, working together, working hard, never giving up, and having a commitment to success), and presenting products from group work. (c) Reflection consists of: Appreciating the results of group work, giving rewards to the group with the best results, providing feedback and motivating for success.

The effectiveness of the PBL model is measured by how capable the model is in increasing achievement motivation and innovation of junior high school students in Bogor. It was concluded that the PBL model significantly increased achievement motivation compared to conventional learning at the junior high school in Bogor.

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