THE EFFECT OF HARD WORK CHARACTER AND PROBLEM BASED LEARNING MODEL TOWARD PHYSICS LEARNING OUTCOMES STUDENTS AT SMPN 4 SEI SUKA

Luqmanul Hakim and Ridwan A. Sani
Jurusan Fisika FMIPA Universitas Negeri Medan
LQ.man.90@gmail.com

ABSTRACT

This research objectives to know: 1) the difference in physics learning outcomes of students using problem based learning model with direct instructional model; 2) the difference in physics learning outcomes of students who have high hard work character with students who have low hard work character; and 3) the interaction between hard work character and problem based learning model toward physics learning outcomes. Population in this research is all of students of SMPN 4 Sei Suka class VIII Academic Year 2013/2014. Samples in this research are class VIII-1 and VIII-3. Samples technique is cluster random sampling. This study used quasi experiment methods. According to research variables there are two types of data collected in this research, namely: 1) hard work data of students and 2) physics learning outcomes data of student. Hard work data of students collected using questionnaires, while data student learning outcomes collected by providing test questions to students. Technique of analyzing data by using ANAVA two ways with the significantt level of $\alpha = 0.05$. The result of research shown that: 1) there is difference in physics learning outcomes of students using problem based learning model with direct instructional model; 2) there is difference in physics learning outcomes of students who have high hard work character with students who have low hard work character; and 3) there is interaction between hard work character and problem based learning model toward physics learning outcomes.

Key Word: Physics Learning Outcomes, Hard Work Character, Problem Based Learning Model.

INTRODUCTION

Education is a process of individual self-development of one's personality that made consciously and responsibly to improve the knowledge, skills and attitudes and values so as to adapt to the environment. Quality education is always a reference to student learning outcomes, where the quality of a good education is the purpose of education itself.

The quality of education is still low in the sharp spotlight and very big problem in Indonesia. According to the survey of Political and Economic Risk Consultant (PERC), the quality of education in Indonesia was ranked 12th out of 12 countries in Asia. The low quality of education in Indonesia was also shown Data Research and Development in 2003 (Al-Jawi, 2006), that of the 146 052 primary schools in

Indonesia was only 8 (eight) schools who gained worldwide recognition in the category of The Primary Years Programme (PYP), from 20 918 junior high school in Indonesia was also only eight schools who gained worldwide recognition in the category of The Middle Years Programme (MYP), and of the 8,036 high school was only seven schools who gained worldwide recognition in the category of the Diploma Programme (DP). Furthermore, in terms of achievement, according to records Trend In Matemathics and Science Study (TIMSS), which measure the outcomes education institutions in the world reported that the ability of science (science) students in Indonesia are in the order 32 of 38 countries (Nurhadi and Senduk, 2003) .

General picture above shows that the low quality of education in Indonesia. The low quality and student learning outcomes in subjects including science also happening in SMP Negeri 4 Sei Suka. Poor quality of education and the acquisition of student learning outcomes, especially in science subjects is an indication of the poor performance of students and teachers the ability to manage quality learning.

There are many factors that affect student achievement both internal factors and external factors. This is in line with the opinions Slameto (2010) which states that "the factors that affect the learning of many kinds, but can be classified into two groups only, ie internal factors and external factors ". External factors that directly affect the students' learning in school is the teaching methods used by teachers in presenting the material and engage students actively in learning. Based on early observations researchers, showed that the teachers are basically trying to engage students actively in learning to use variety of teaching methods. But in practice proses learning that teachers do in the classroom are still dominated by the teacher (teacher centered).

Internal factors that also affect student learning one of them is the psychological factors include: intelligence, attention, interests, talents, motives, attitudes, maturity, readiness, and study habits. This indicates that student success in learning is also influenced by factors derived of the student's own one of them is a learned habit factors including the seriousness or the hard work of students in learning. Results of preliminary observations in SMP Negeri 4 Sei Suka found a low of hard work of students in learning physics. This is evident from: 1) the number of students who cannot do the work teachers are given properly and on time, 2) students tend to be passive and less enthusiastic or less motivated in learning, 3) students also lack focus or concentrate on learning the teachers, 4) students also embarrassed or afraid to ask when having trouble learning material physics, 5) the tasks that the teacher is not done in earnest student, 6) most of the students are also too easy to give up and say not able to resolve the matter when asked to finish her teacher on the blackboard, 7) during the learning process of the students also seem relaxed and do not want to try to strive to understand the subject matter being taught physics teacher.

Observation of results which have shown that teachers are basically trying to engage students actively in learning but learning p roses that teachers still dominated by the teacher (teacher centered). Students are also very accustomed to learning in a relaxed way, less seriously or less seriously, and not trying to work hard to understand and solve the physics problem set by the teacher. Conditions

and students' learning habits so of course a bad influence for the development of the student learning including low learning achievement of students of physics.

Level of Junior High School (SMP), physics is a branch of natural science, and as a basis for studying the physics of materials at the higher education level is high school education or high school equivalent. Physics subjects is one of the subjects science that can develop analytical thinking skills by using a variety of events deductive nature and problem solving both qualitatively and quantitatively using mathematical and can develop the knowledge, skills and attitude of confidence.

Students are expected to gain experience in shaping the ability to reason deductive quantitative mathematical based on qualitative analysis using a variety of physics concepts and principles through study of physics (Departemen Pendidikan Nasional, 2003). Science is the result of human activity in the form of knowledge, ideas, and concepts are organized on the environment based on experience gained through a series of scientific processes. This means that physics should be taught to students completely as scientific attitude, scientific process, and scientific products, so that students can learn independently to achieve optimal results. One way to teach physics completely is to choose the suitable learning model. According Butar-butar (2010), the Problem Based Learning (PBL) model is the appropriate model for the development of Physics Science.

PBL is a learning model that presents problem to students before they construct their knowledge. The problem presented is problem which always experienced by students in their daily live. Through PBL students trained construct their own knowledge, develop problem solving skills, accustomed in using media, and used to enhance interaction among students of students, so students become independent, more confident and have a great motivation in learning physics. Problem-based learning is an educational methodology that emphasizes real-world challenges, higher order thinking skills, interdisciplinary learning, independent learning, information-mining skills, teamwork and communication skills (Tan, 2003). Arends (2009) states that there are three learning outcomes (outcomes) obtained learners who are taught by PBL, namely: (1) inquiry and problem solving skills, (2) adult role behaviors and social skills, and (3) skills for independent learning. Students should have hard work character to become independent learning.

Based on the descriptions above, it is understood that in the process of learning physics in addition to the ability of the teacher to design and manage learning that can engage students actively in learning and solving physics problems is also necessary seriousness and hard work of students in learning and understanding the concepts of physics teachers taught, so that students can solve problems related to the physics that ultimately students can obtain a more optimal learning outcomes.

Hence, needed to study more in depth about hard work of students in learning physics and Problem Based Learning (PBL) model to increase the learning outcomes of students in Physics with title The Effect of Hard Work Character and Problem Based Learning Model toward Physics

Learning Outcomes Students at SMPN 4 Sei Suka.

RESEARCH METHOD

This research will be held in SMPN 4 Sei Suka in class VIII in even semester Academic Year 2013/2014. This study will be conducted on March 2014 with a time of study tailored to the educational calendar for the implementation of the treatment in the learning process.

Population in this study are all of students of SMPN 4 Sei Suka class VIII Academic Year 2013/2014, consist of 5 classes. Samples in this research are class VIII-1 and VIII-3. Samples technique are cluster random sampling.

Sampling steps are as follows. Each group was divided into two groups with students who have high hard work character and students who have low hard work character using observation sheets and questionnaire of hardwork character.

Experiment design used in this study is a 2 × 2 factorial design as shown in Table 1.

Table 1. Factorial Design 2 × 2

	Learning Model	
Hard Work Character	**Problem Based Learning Model (A1)**	**Direct Instructional Model (A2)**
High (B1)	A1B1	A2B1
Low (B2)	A1B2	A2B2

Description:

A1B1 = learning outcomes of students who have high hard work character taught by problem based learning model.

A2B1 = learning outcomes of students who have high hard work character taught by direct instructional model.

A1B2 = learning outcomes of students who have low hard work character taught by problem based learning model.

A2B2 = learning outcomes of students who have low hard work character taught by direct instructional model.

According with research variables previously mentioned, there are two types of data collected in this study, namely: 1) the data the hard work of students and 2) physics student learning outcomes data. Hard working student data collected using questionnaires, while data student learning outcomes collected by providing test questions to students.

RESULT OF RESEARCH

Those hypothesis are analyzed by using Analysis Variance Two Ways with SPSS 16.0 for Windows.

Testing criteria:

- If the probability value or significant > 0.05 then Ho is accepted or rejected Ha.

- If the probability values significant <0.05 then Ho is rejected or accepted Ha.

Based on calculations, shown briefly Analysis Variance Two Ways test results in Table 2 below.

Tests of Between-Subjects Effects

Dependent Variable:Learning Outcomes

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1683.34[a]	3	561.11	12.39	.00
Intercept	393764.34	1	393764.34	8696.64	.00
LM	446.68	1	446.68	9.87	.00
HW	293.13	1	293.13	6.47	.01
LM * HW	1032.09	1	1032.09	22.80	.00
Error	2716.66	60	45.28		
Total	401300.00	64			
Corrected Total	4400.00	63			

a. R Squared = .383 (Adjusted R Squared = .352)

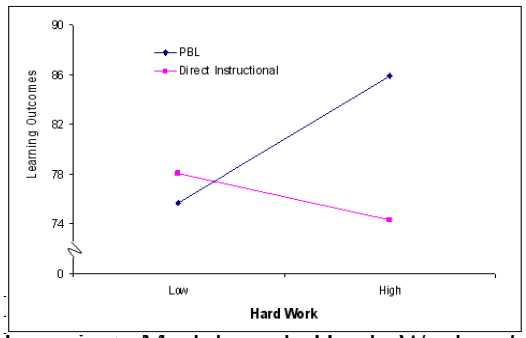
Table 2. Summary of analysis variance two ways test

Based on the results in Table 2 above, obtained some conclusions as follows:

1. Based on LM (Learning Models) column obtained F value of 9.87 and a probability value or significant of 0,00.
   At $\alpha = 0.05$; df1 = 1 and df2 = 60 (df error) obtained F_{table} value of 4.00. Because $F_{count} > F_{table}$ is 9.87 > 4.00 and a probability value or significant 0.00 < 0.05 then the H_a is accepted or rejected H_o, which means that the first hypothesis is accepted and verified at the level of $\alpha = 0.05$. Thus, it was concluded that There is difference in physics learning outcomes of students using problem based learning model with direct instructional model.
2. Based HW (Hard Work) column obtained F value of 6.47 and a probability value or significant of 0.01.
   At $\alpha = 0.05$; df1 = 1 and df2 = 60 (df error) obtained F_{table} value of 4.00. Because $F_{count} > F_{table}$ is 6.47 > 4.00 and a probability value or significant 0.01 < 0.05 then the H_a is accepted or rejected H_o, which means that the second hypothesis is accepted and verified at the level of $\alpha = 0.05$. Thus, it was concluded that There is difference in physics learning outcomes of students who have high hard work character with students who have low hard work character.
3. Hereinafter, based on the LM * HW column obtained value F = 22.80 and probability value or significant of 0.00.
   At $\alpha = 0.05$; df1 = 1 and df2 = 60 (df error) obtained F_{table} value of 4.00. Because $F_{count} > F_{table}$ is 22.80 > 4.00 and Sig value of 0.00 < 0.05 then the H_a is accepted or rejected H_o, which means that the third hypothesis is received and verified at $\alpha = 0.05$. Thus, it was concluded that There is interaction between hard work character and problem based learning model toward physics learning outcomes.

Testing results the third hypothesis stated that there was an interaction between the model of learning and hard work of the students' physics learning outcomes. Such

interactions can be visualized in Figure 1 below.



Learning Model and Hard Work of Students toward Physics Learning Outcomes of Students

Discussion

Results of research, showed that the average value of the physics learning outcomes of students were taught by problem based learning model (81.09) is higher than the average value of the physics learning outcomes of students taught by direct instructional model (76.41). It is also evident from the results of the analysis variance two ways by which the value of $F_{count} > F_{table}$ is 9.87 > 4.00 and a probability value or significant 0.00 < 0.05

Conclusion above also supported by Butar-butar opinion (2010) based on the research result that problem based learning model giving physics learning outcomes of student better than direct instructional model. Through problem-based learning, students learn how to solve problems that are ill-structured, open-ended or ambiguous. Problem based learning engages students in intriguing, real and relevant intellectual inquiry and allows them to learn from life situations (Ng Chin Leong quotes in Barell, 2007).

Based on the observations made during the learning process in the classroom also appears that students were taught with problem based learning model more active both during the group discussion and present the results of the discussion infront of the class. They seemed to enjoy the learning process was ongoing and trying to find a solution to resolve the problem.

While the group of students who were taught with direct instructional models, the learning process tends to be one way in which the teacher as a conduit of information and students as recipients of information. Learning activities were also more dominated by the activities of teachers (teacher-centered) in delivering course material. During the lesson students seem more silent or passive, and students only active on pay attention to the teacher's explanation in class, then do the tasks individually given by teacher, and for students learning also seem less spirit, learning that takes place as well as more focused to make notes and memorization alone.

Based on the results and research that had been obtained, it can be indicated that the problem based learning model provides a better effect on physics learning outcomes of students than direct instructional model. Thus, the results of research that has been done shows that the physics learning outcomes of students who were taught with problem based learning model higher than physics learning outcomes students who were taught with direct instructional model.

The learning model not the only one factor that determines the success of the achievement of learning objectives, but these are the complexities that require a more in-depth study. In addition to learning models that will be implemented, teachers are also required to better understand the characteristics of students, including student hard work

The result of the research, showed that the average physics learning outcomes the group of students with high hard work both taught with problem based learning model and taught direct instructional model (80.65) is higher than the average physics learning outcomes the group of students who have low hard work (76.97). It is also evident from the results of the analysis of variance two ways by which the value of $F_{count} > F_{table}$ is 6.47 > 4.00 and a probability value or significant 0.01 < 0.05

The conclusion of the research that has been done is also reinforced by the opinions Zuhdi, (2011), which explains that the characteristics of a person who has hard work attitude include: 1) the earnest study and work, 2) does not quickly get bored with the given task, 3) trying to fix the error, 4) do not easily give up when experiencing difficulties and failures, 5) do the tasks diligently and thoroughly, 6) keep the spirit in the face of problems, and 7) do not depend on other people in the working on school assignments. This gives an indication that the students will gain optimal learning results if the students have a high hard work attitude.

CONCLUSION

Based on the results of the study, data analysis and hypothesis testing, then some conclusions can be drawn as follows:

1. There is difference in physics learning outcomes of students using problem based learning model with direct instructional model. Physics learning outcomes of students who were taught using problem based learning model (81.09) is higher than students who were taught using direct instructional model (76.41).
2. There is difference in physics learning outcomes of students who have high hard work character with students who have low hard work character. Physics learning outcomes of students who have high hard work character (80.65) is higher than students who have high hard work character (76.97).

There is interaction between hard work character and problem based learning model toward physics learning outcomes. This gives the meaning that the interaction between learning models and hard work of students affects physics learning outcomes of student.

SUGGESTION

Based on the research results and conclusions above, then as a follow up this research suggested to science teachers are expected to be more creative and innovative in selecting and determining learning model that will be used in presenting the material, especially material physics, the teacher can use problem based learning models in teaches physics concepts that students are more actively involved in the learning process and trained to be able to solve various problems faced by the students as well as removing the mind set of students that physics is a difficult subject, tedious and requires high intelligence so that most of the students are less interested and less motivated to learn physics.In order for the application of learning models that teachers do work effectively and efficiently teacher should identify first the characteristics, needs and hard work attitudes of the students. If the majority of students in the class have high hard work character the teachers should use the problem based learning models, and if the majority of students in the class have low hard work character the teachers should use direct instructional

models. Application of models steps also need to be prepared well by teachers so it can actively involve students directly in the learning process, making learning more fun and meaningful which finally students can obtain a better and optimal learning outcomes.

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