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Perception of Teachers in Math Learning using Problem Based Learning Model

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ABSTRACT

Learning process determines the improvement of students' learning achievements. Selection of an appropriate learning experience is the task of the teacher as a facilitator in charge of providing a supportive learning environment for the students. This study aims to determine the perception of teachers after implementing learning using Problem Based Learning model. The subject of this research is the Math teachers at State Senior High School 1 Wuryantoro, Wonogiri Regency, Academic Year 2017/2018. Data are collected using interviews to find out teachers' perceptions of the implementation of Problem Based Learning model. The result shows that the Problem Based Learning model makes it easier for teachers to learn in the classroom because students are more interested and active, but teachers are often constrained in constructing contextual problems that can connect with the intended concept. Limited time allocation is also a constraint of implementing learning using Problem Based Learning.

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INTRODUCTION

Learning Math at Senior High School according to 2013 curriculum demands students to engage actively in the learning activities. This is important because senior high school is the level of preparation leading to the college, where students have to be independent in learning. According to (McNeil, 2015) Math curriculum in primary and secondary schools needs to be improved before going to higher education. In Math, there are some basic capabilities, one of which is the ability of problem solving. The application of 2013 curriculum in schools is expected to improve the learning model used in learning so that it can increase the activeness and creativity of students in solving problems. In 2013 curriculum, students are not only required to master

knowledge aspect, but also on attitude and skill aspects. The purpose is that students have the competence and life skill in solving problems in their life.

One of the goals of learning Math is to prepare students to be able to solve the problems faced in his life so that the use of appropriate learning model is expected to boost creativity and activeness of the students in the the learning process. But in the process, teachers are still not optimally use the learning model in accordance with the material presented so that student learning achievement has not been as expected. Teachers are expected to provide exercises to the students to solve the problem through a matter of stories related to the concept of learning Math. Learning objectives will be achieved if the teacher is also creative in facilitating student and invite students to participate actively in the teaching and learning activities. According to Abdullah (Abdullah et al, 2010) that student achievement will increase if students are actively involved in learning, able to contribute, and provide participation in group discussion activities. The use of various learning models and interesting learning media are expected to attract the students' attention.

In fact, not all senior high school teachers in Indonesia can master the understanding of 2013 curriculum as expected by the government. The government has organized training start from national level, continued by province, Regency, and school through instructors who have been chosen, but it has not meet the teachers' need. Teachers should equip themselves with the ability to innovate learning, to take various initiatives, and have an understanding of a wide range of theory and practice of learning.

Based on observations in one of the schools, teachers often give students the theory and will ask them to memorize, so they less involve students in learning activities. According to (Liu et al, 2014) the identification of the student's mental condition is an attempt to raise the awareness of teachers against the initial concept owned by students as an internal image of students. In addition, based on the social constructivist perspective, students should not be neglected in the process of learning (Ibrahim, 2005)

Based on this situation, innovative effort is needed in improving quality of learning, that is by using the appropriate learning model. One of the learning models that is often used in the implementation of 2013 curriculum is the Problem Based Learning (PBL). According to (Chia and Chin, 2005) in the PBL, problems serve as a stimulus for students so that learning activities will help students to understand why and what for they learn. In addition, the end form of the learning activity in the PBL i.e. students is asked to make application of what has been learned, task of learning more, homework, or any other form (Harvey et al, 2013) Problem Based Learning is a learning model that helps teachers develop skills to solve problems in students during their study learning material.

The fundamental thing that must be addressed by teachers is a mental preparedness to the changes that occur in 2013 curriculum. The teacher is someone who involves and understands their students' conditions directly. Teachers are expected to be ready and open to the possibility of some changes. Teachers should pay attention to at least four aspects in implementting 2013 curriculum, i.e. pedagogy competence, professional competence, social competence, and personality competence. The role of teachers in learning using PBL is very important. They must become facilitators. Teachers should be able to steer or help students to determine what they have known, what they need to know and where they can find important information (Bilgin, 2009) and thus students are able to understand what and why they must learn. Learning to use the model of PBL

will be optimized if the concepts taught are related to everyday' life. This is in accordance with the principle of PBL that the problem must be the real world so that students can easily apply them in their daily lives (Graaf, 2003).

Some researches that have already done: (Graaf and Kolmos, 2003) stated that the wider process of PBL can create opportunities to develop meaningful knowledge, attitudes and skills related to with collaborative learning. So, it can build knowledge in cooperation effectively to help students in making explicit relationship between attitudes and cooperation and achieving learning achievement; and to identify the special collaborative skills needed by the students, and the result obtained through the cooperation of the group. In line with that, (Ekapti, 2016) revealed that PBL is widely regarded as a successful and innovative methods for engineering education because PBL model support a lifelong learner to take responsibility for the learning process of their own. According to (White, 2001) that PBL is an effective method to improve student problem solving abilities. Students become stronger in linking concepts and facts gained in learning and active in seeking information rather than passive learning and receiving only information from teachers. Based on these studies, the PBL model is effective to improve students' learning achievement.

State Senior High School 1 Wuryantoro is one of the senior high school that implements 2013 curriculum at Wonogiri Regency. The background of the students accepted in State Senior High School 1 Wuryantoro, in general, are on the medium ability. This is due to its location, which is not too far from some favorite senior high schools in Wonogiri, so that students with high abilities usually study into senior high school in the town of Wonogiri. Facilities of the book sources and the internet network are also insufficient so that students and teachers access are also limited. The whole teacher State Senior High School 1 Wuryantoro have already followed the training on the 2013 curriculum at least in school level. At the time of implementing 2006 curriculum, learning Math is still used lectures method, but after the application of the 2013 curriculum, the teacher had already begun trying to apply a wide range of innovative learning models, one of which is the model PBL learning.

Based on the description of the background above, the researchers conduct a study to find out the perception of teachers towards Problem Based Learning model on the application of the 2013 curriculum in State Senior High School 1 Wuryantoro. Furthermore, by using PBL model, teachers can know the advantages and apply the model in classroom learning. In addition, teachers can also find out the disadvantages of implementing PBL and improve the minus points.

Researchers are interested in conducting a research titled "Perception of Teachers in Math Learning Using Problem Based Learning Model" in State Senior High School 1 Wuryantoro, Wonogiri Regency.

METHODS

This research is conducted in State Senior High School 1 Wuryantoro, Wonogiri Regency in 2017. The method used in this research is direct interview of six Math teachers in Senior High School 1 Wuryantoro. Interview aspects include the preparation of lesson plan, the use of learning method, preparation of worksheet, and application of literacy in learning. Researchers arranged grids and then, question points are used to gain information. Interviewee provides answers and there are also feedbacks from the researchers. Interview results are then analyzed descriptively.

RESULTS AND DISCUSSION

Based on the result of research, it is found that teachers have used PBL model in learning. It can be seen in the lesson plan. Some teachers have written the PBL model in lesson plan, but the learning steps have not been in accordance with the PBL syntax. This is because teachers do not develop their own lesson plan. In learning activities, teachers give examples of real-life problems related to the material to be learned in the classroom. Some teachers use worksheets in discussion activities but some others still use the book. Teachers try to direct students to ask questions and seek information about the problems faced. In fact, some students still have difficulty in group discussions. Consequently, teachers tend to teach as usual. Teachers try to emerge a culture of literacy by asking students to search for material in libraries or the internet, but some students are not able to implement it because other subjects also demand it.

According to teachers, the PBL model keeps students active in learning and helps students to understand the material better, but teachers should try to create a comfortable classroom situation for learning. Teachers should prepare a work sheet that contains problems to be learned. It is certainly not an easy and short thing to do. In addition, teacher competencies are different. Then, the learning will take a relatively longer time. In the learning process, teachers still often use lecture method to deliver the material. In the classroom, teachers usually do not repeat the material because the teacher must pursue the target to complete the learning materials in accordance with the syllabus, with the lesson plan that has been prepared, and the target to meet the National Examination indicator.

Table 1. Interview transcript that has been done by the interviewer (A) and interviewee (B)

Interview aspects	Interview transcript
Lesson Plan	A How do you make the lesson plan?
	B I got it from the internet and the regency Math teachers' forum
	B Do you still do some editing on it?
	Just a little part. We just change the identity, because time is limited
Learning activity	A How do you carry out learning in the classroom?
	B I have difficulty in guiding students to discuss and present the work
	B What is the problem?
	The students' early ability is still weak and their confidence is low
Students' worksheet	A How do you make the student worksheets?
	B I usually download from internet or copy from other colleagues.
	B Why do not you make the worksheets by yourself?
	Searching for issues that suitable with the theme is not an easy thing. Besides, our time is limited.
Literacy	A How do you create literacy in the classroom?
	B I usually ask students to search for information from books

Interview aspects	Interview transcript
	or internet, then share them.
A	What are difficulties of the activities?
B	Usually, students are less familiar with the task given. In addition, many tasks of other subjects make students sometimes neglect the given tasks.

In this research, the perception of Math teacher is focused about the application of the learning model of Problem Based Learning. The measurement result of teachers' perception toward the application of the learning model of Problem-Based Learning is taken based on the results of the interview, focused on activity of learning and learning tool that includes lesson plan and worksheets.

Lesson plan used by teachers in the learning model of PBL with scientific approach contains activities to observe, collect information, communicate, and associate. Based on the data analysis of interviews results with Math teachers of State Senior High School 1 Wuryantoro, there are similarities that the teachers have not been completely make the lesson plan and develop it. The lesson plan that has been made is not based on the syllabus, but it is based on the example of syllabus as the results of the discussion in the Regency teachers' forum or comes from another school. The reason why teachers do not make and develop their own lesson plan on this 2013 curriculum is because the teachers still have the difficulty of changing mind set of 2006 curriculum. In addition, the reasons is there is not enough time to make the learning tools; the syllabus, the annual program, the semester program, the assessment program, the lesson plan, the follow-up program, and others. Some teachers also teach more than one level so that their duties are plentiful. These problems can be solved by optimizing the discussion among Math teachers at school so that it will be more effective. Teachers need to adapt learning tools from various sources and match them with the conditions of students and schools; including students' early abilities, students' intakes, and facilities owned by the school. School plays an important role in facilitating teachers to be able to arrange their desired learning tool.

The teacher is demanded to be more creative and innovative so that the learning becomes fun, inspiring, challenging, motivating students to actively participate and provide enough room to accommodate creativity and independence related to the talents, interests, and physical and psychological developments of students. Interview results indicate that the pace of learning, which includes the preparation, implementation, and assessment can be well understood by the teacher. In this interview, it is deeply analyzed about the steps learning in PBL as the core of the implementation of the study. The PBL learning steps are as follows: (1) orient students to the problem, (2) organize the students to learn, (3) guide individual and group investigations, (4) develop and present the results of the work, and (5) analyze and evaluate the process of problem solving.

At stage of orienting students to the problem, the teacher is faced with a situation that is able to evoke the interest of students, then continue to activities that can lead to the desire of students to investigate themselves. The teacher starts the activity of learning by giving problem, asking questions, suggesting to search for references and other learning activities that lead to the preparation of the problem solving. After that, teacher's next step is to give the opportunity to students to express ideas or opinions

toward the given problems. Next, the teacher organize students in learning by giving the opportunity to the students to collect as many as information to resolve the problem. In this step, teachers' success shown by the ability to make students feel motivated by being active when they have discussions with friends. Teachers need to pay attention to time allocation so that the next steps can go according to plan. Lesson plan is a must for teachers. This is consistent with (Sun and Yang, 2009) that learning which pays attention to the effectiveness of time will benefit students, teachers, and schools.

At the stage of guiding the individual and group investigation, teachers still play a role in the discussion. Most students still have difficulty in identifying problems and seeking information on the issue or finding other things related to the problem they have. Teachers should never explain, but they are required to direct them so they can find out themselves. It has also become an obstacle, besides having a wider knowledge, teachers also have to be clever in communicating with their students.

At the stage of developing the result of work, usually students still have difficulty in writing down systematically and the confidence to present in front of the class is still quite low. Teachers that should only act as a facilitator sometimes they become moderators and help students in answering. This is certainly going to increase the duration of time of learning. As a result, the allocation of time to analyze and evaluate problem-solving process often neglected so teachers can less know the problems experienced by students in PBL learning. Providing reward and punishment to students or discussion groups are expected to increase interest and enthusiasm in solving the problems. The teacher should start trying to give the students confidence in understanding the material. According to (Kelishadroky et al, 2016) that reward and punishment can increase learning motivation and are integral parts of education and should be used from time to time.

In general, learning using PBL makes students more active and able to improve the learning achievement of students, however, in practice the teacher is required to work hard and teach creatively. This is in accordance with (Ozdemir and Ozdemir, 2017) that the application of PBL learning model that is integrated with the scientific approach is able to improve the learning achievement of students. Barriers or obstacles of teachers in implementing the learning model Problem-Based Learning include: (a) the teachers are book-oriented, (b) the teachers are still having trouble in creating the atmosphere of an interactive and interesting classes, (c) students are not yet fully understand the steps in the learning Problem Based Learning model so that it requires a relatively long time, (d) teachers are still having trouble in compiling problems in the real world which can lead to the intended concept, (e) the lack of teachers preparation before teaching related with the worksheets and the media because of the demands of administrative duties of teachers.

CONCLUSION

It consists of your finding analysis and results. Based on the results of research and discussion, then the conclusions are as follows. (1) teachers are not fully doing problem-solving steps in learning, beside students do not fully understand about learning using the model of PBL. This leads to learning that does not run maximally. Teachers need to provide socialization about PBL models to students

2). Learning to use the problem solving also haven't done well because students cannot follow the learning that uses problem-solving. Besides, the implementation of

PBL has not been done maximally because it is limited by time. Teachers need to pay attention to time allocation so that each step can be done optimally. In addition, teachers should try to improve students' motivation by providing educate reward and punishment.

(3). Application of the method of problem-solving can teach students about the problem-solving step that is good and correct, but its implementation has not been run maximally. Teachers need to improve the literacy program that is expected to improve students' ability to understand a problem and add insight in finding a problem solving.

Based on research results, discussions and conclusions, the authors propose some advices as follows: (1) teachers should maximize learning using PBL with time management more thoroughly and prepare the media and learning resources earlier. It aims to make learning work effectively.(2) teachers should maximize the role of students and do not dominate the learning in the classroom, included in creating problem but keep redirect so that the atmosphere of the class remain conducive. Teachers can maximize literacy program, so that students do not feel bored and feel interested to learn Math.(3) teacher should be creative in creating problem which is related to the intended Math concept. After the concept has been obtained, it is expected students are able to solve various problems and at last, they can improve their learning achievement.It could conclude some figures and tables to support your statements.

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