

**The Influence of Problem based Learning, Inquiry, and Learning Style
to the Students' Learning Outcomes of Social Science Subject
in Junior High School in Indonesia: A Case Study**

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Abstract

This study aims to examine the effect of Problem Based Learning (PBL), inquiry learning methods, and student learning styles (auditory, visual and kinesthetic) on the students' learning outcomes in grade VII of State Junior High School (SMPN) 1 and SMPN 2 Tanah Merah, Indonesia for Social Science subjects. In this case, the researcher wants to find out: (1) was there any difference in Social Science subjects learning outcomes between groups of students who used Problem based Learning with groups of students who used inquiry lessons? (2) was there any difference in Social Science subjects learning outcomes of students who had different learning styles? (3) was there the interaction between the learning method used with the student learning style on students' learning outcomes in solving problem in Social Science subjects? This researchers used questionnaire instrument contained type of students' learning style to know students who had kind of auditory, visual and kinesthetic learning style. Meanwhile, it was to know the ability of students in solving problem after learning using PBL and inquiry. Researchers used test results. The test of the learning outcomes was done three times in each group. This research was conducted in both schools from January to February 2018 by using experimental method, with 2x3 factorial design using two-way ANAVA technique. The sample was 60 students; 30 students were as experimental group of PBL learning method with 10 students had auditory style learning style, 10 students had kinds of visual learning style, and 10 students had kind of kinesthetic learning style. While 30 more students were as control group using inquiry method of learning with 10 students had auditory learning style, 10 students had visual learning style, and 10 students had kinesthetic learning style. From the results of this study, it was obtained the conclusion: 1) PBL learning method was better than inquiry method of learning, (2) different learning styles of students had influence on students' learning outcomes in solving the problem, and (3) there was interaction between learning methods and learning styles of students on students' learning outcomes.

Keywords: Problem Based Learning Method, Inquiry Method, Learning Styles, Students' Learning Outcomes

1. Introduction

In general, factors that influence learning outcomes can be divided into two; internal factors and external factors. Students' internal factors are divided into two; psychological and physiological factors, while external factors include environments, teachers, social factors, and learning methods. Likewise, there are some factors affecting effectiveness of learning that are from inside and outside of the students. Ismail (2008, p. 31) mentions one factor including the quality of arrangement of learning elements by considering the method and its effectiveness. There are some suggested methods to use in effective teaching and learning such as cooperative learning, active learning, problem solving learning, and inquiry learning.

From the early observation conducted by researchers on September 12, 2017 in Junior High School (SMP) Tanah Merah concerning Social Science (IPS) subject, it was obtained that teachers did not use any variety of learning method. Conventional methods were still implemented in the teaching and learning process. It was strengthened by the interview data from the teachers conducted on September 12, 2017 that most of them still used lecturing and pair discussion without any integration of other methods. In addition, the interview data from interview done on September 18 and 19, 2017 indicated that some other teachers used cooperative learning methods in teaching Social Science subject.

One of the problems faced by teachers is that certain methods cannot be applied in all classes because each class has different students' characteristic. There are many many learning method which can applied to students. One of the learning methods is method is Problem Based Learning (PBL). This method emphasizes more on students' activity in finding solutions toward the problems. Students are divided into some groups and given a problem to find the solution systematically and logically. In applying this method, the teacher gives opportunity to students to determine the topic of problem.

Other learning method that can be applied is inquiry learning. Inquiry learning is a teaching technique in which teachers involve students in learning process through the use of how to ask, problem based learning activities, and thinking critically. This matter will take time in its preparation. Inquiry is usually done in the form of collaborative work. Class is divided into small groups. Each group is given a problem or question to work together to develop a project based on the given question. Because inquiry learning is based on questions, teachers should prepare open

questions. Students should be given opportunity to find concepts that have been taught. More over, students were also given opportunity to evaluate thier own learning progress. Inquiry is a lerning process that include solving problems, planning experiment, doing experiment, collecting and analyzing data, and concluding the experiment. Therefore, in Inquiry learning, students are involved mentally and physically to solve problems given by teachers.

DePorter, Bobbi & Hernacki, Mike (2006) said that students' learning styles generally are devided into visual, auditory, and kinesthetic. Those students' learning styles have different way and approach based on the students' characteristic. In teaching and learning Social Science (IPS) subject, the learning styles of students are different according to the ability of the students toward the materials. Based on the inteviuw with the teachers of the subjects in SMPN 2 Tanah Merah, it was found that the students learning styles was different in each classess.

Above explanantion indicates that the students' learning outcomes of Social Science subject are stil far from being expected by teachers and school. Therefore, it is needed an analysis relating to the influencing factors covering the methods that are applied by the teachers and the students' learning style.

This research is to find out the following questions (1) is there any difference of using Problem Based Learning (PBL) method and inquiry learning to the students' learning acievement in Social Science subject in class VII State Junior High School (SMPN) 1 and SMPN 2 Tanah Merah Bangkalan? (2) is there any difference of learning style of visual, auditory, and kinesthetic to the students' learning achievement in Social Science subject in class VII State Junior High School (SMPN) 1 and SMPN 2 Tanah Merah Bangkalan? and (3) is there any interaction between the use of Problem Based Learning (PBL) and inquiry learning method to the students' learning achievement in Social Science subject in class VII State Junior High School (SMPN) 1 and SMPN 2 Tanah Merah Bangkalan?

Scientific learning is a learning that follows some stages through scientific methods. This learning method is intended to develop the skills of scientific thinking, "sense of inquiry", and ability in thinking creatively (De Vito, 1989). Learning model requires producing the ability to learn (Joice & Weil, 1996), not only to obtain number of knowledge, skill, and attitude (Zamroni, 2000; Semiawan, 1998).

Problem Based Learning (PBL) represents an approach by making confrontation to students with practical problems through stimulus in learning. Problem Based Learning (PBL) has the following characteristics: (1) learning is started with problems, (2) the problems are related with the students' real world (3) it focuses on the problems, not the discipline of science, (4) it gives full responsibility to students in experiencing directly the learning process, (5) it uses small group, and (6) it demands students to demonstrate what they have studied in the form of product or performance.

According to Sanjaya (2008, p.196), inquiry learning is student centered and active learning that emphasize students to think, conceptualize, analyze, and find the knowledge themselves. Hence, students can understand the core of the discussion in learning process. This way leads students to find the sources of relevant knowledge. In this case, teachers still become facilitator to guide students in finding the solution of the existing problems. Thus, student can conclude what they get themselves.

Experts have given some explanations regarding learning style. Basically, ability of someone to comprehend lessons is definitely different, They can be fast, medium, and also slow. Therefore, students often have different ways to understand the Lesson. Learning style is typical way of students learning (Winkel, 2009). Muhammad (2007) told, "learning style is a way that is tended to be selected by a person to get and receive information from environment". While Deporter et al. (2006) told that learning style is the combination of how to absorb, then arrange, and also manage information.

2. Research Method

This research was quasi experimental research since this research could not control all external variables that influenced the conduct of the experiment (Sugiyono, 2006). This type of design used factorial design 3X2. This allowed researcher to investigate simlutaneously the influence of two or more treatments of variables. There were six classes which were used in this research. Experimental class included 4 classes; 2 classes in SMPN 1 and 2 classes in SMPN 2 Tanah Merah Bangkalan

Data analysis techniques in this research was used to analyze the acquisition of students' learning outcomes of Social Science subject seen from their learning styles. Data collection technique used in this research was combination technique of questionnaire and assessment with natural setting that was done in the real class. Questionnaires were used to know the students' response toward the learning styles. Assessments or tests were used to know the score students learning outcomes.

Questionnaires were used to group students based on the learning style of auditory, visual and kinesthetic.

Instruments used were test results of Social Science subject and questionnaires of students' learning style. Validity test was used to measure how far instruments could measure what ought to be measured. Reliabilities are index to show how far an instrument can measure different subjects.

Before data were used for hypothesis test, normality and homogeneity test had been done. Examination for each hypothesis after data is known that the data obtained is normally distributed. To determine the distribution of the data obtained from the research are normally distributed or not, data were tested with normality test using SPSS software. The obtained data are said to be normal if the result of coefficient calculation is bigger than 0,05, but if coefficient calculation is smaller than 0,05, the data were not normal.

3. Result and Discussion

3.1. Result

Based on the result of the questionnaire from the research population above, it was obtained that From the total of 190 students, there were 101 (53,2%) students who had auditory learning style, 66 (34,7%) students had visual learning style, 23 (12,1%) students had kinesthetic learning style.

Tables 1. Summary the Result of Questionnaire regarding the Type of Learning Style

No	Type of Learning Style	The Number of Student	The Number of Percentage
1	Auditory	101	53,2%
2	Visual	66	34,7%
3	Kinesthetic	23	12,1%
	Total	190	100%

From the test of normality by using One-Sample Kolmogorov-Smirnov Test, it was obtained the value of Asymp. Sig. (2-tailed) = 0.098 > value criticize 0.05. Thereby we can see that sample data of the population had normal distribution, both data of students in different methods and different learning style. From the homogeneity test, it can be concluded that group of students' data using PBL and inquiry method had "homogeneous variants". Similarly, the group of students' data with

auditory, visual, and kinesthetic learning style had "homogeneous variants". It can be seen from the result of obtained calculation of the value $\text{Sig} = 0.352 > \text{value critic } 0.05$.

From the source of interaction variation between the method and learning style, it was obtained value of $\text{sig}.0.091 > \text{values critic } 0.05$. Hence, the ability of student in solving the problem in Social Science subject at MP1 was not influenced by interaction between learning method in the topic of Social Interaction Identification and students' learning style. This is to say that there was no interaction between learning method which was used with students' learning style to students' learning outcome in Social Science subject. From normality test by using One-Sample Kolmogorov-Smirnov Test, it was obtained the value of $\text{Asymp. Sig. (2-tailed) } = 0.099 > \text{value criticize } 0.05$. Thereby we can see that sample data of the population had normal distribution, both data of students in different methods and different learning style. From the homogeneity test, it can be concluded that group of students' data using PBL and inquiry method had "homogeneous variants". Similarly, the group of students' data with auditory, visual, and kinesthetic learning style had "homogeneous variants". It can be seen from the result of obtained calculation of the value $\text{Sig} = 0.141 > \text{value critic } 0.05$.

From the source of variation learning style, it was obtained the value of $\text{sig}.0.001 < \text{value critic } 0.05$, hence, it was concluded that students with type of auditory learning style, student with type of visual learning style, and student with type of kinesthetic learning style had different ability of solving problem in Social Science subject at the subject matter two (MP2) or there was different learning result in solving problem of students who had different learning style. From the source of interaction variation between method and learning style, it was obtained the value of $\text{sig}.0.000 < \text{values criticize } 0.05$. Therefore ability of student in trouble-solving of Social Science subject at the subject matter of the Influence of social Interaction on the Formation of Social Institution was influenced by interaction between learning method with type of students' learning or there was interaction between learning method which was used with students' learning style on learning result of Social Science subject.

From the normality test by using One-Sample Kolmogorov-Smirnov Test, it was obtained the value of $\text{Asymp. Sig. (2-tailed) } = 0.134 > \text{value critic } 0.05$. Hence, it can be seen that sample data from population had normal distribution, both group of students' data with different method and different learning style. From homogeneity test of the table above, it can be concluded that students' group

data using PBL and students' group data using Inquiry method had "homogeneous variants". So that students data at students' group with type of auditory, visual, and kinesthetic learning style had "homogeneous variants". This conclusion can be seen from the result of calculation of the value of $\text{Sig} = 0.301 > \text{value critic } 0.05$.

From the source of interaction variation between method and students' learning style, it was obtained the value of $\text{sig}.0.002 < \text{value critic } 0.05$. Hence, the ability of student in solving problem of Social Science subject on the subject matter of Social Institution was influenced by the interaction between learning method and students' learning style or there was interaction between learning methods that was used with students' learning style to the ability of solving problem. From the normality test by using One-Sample Kolmogorov-Smirnov Test, it was obtained by value of $\text{Asymp. Sig. (2-tailed)} = 0.689 > \text{value critic } 0.05$. Thus, it can be seen that sample data from population had normal distribution, both data of student' group method and Students' different learning style. From the homogeneity test, it was concluded that students' group data using PBL and students' group data using inquiry method had "homogeneous variants". Also, students' data at students' group with type of auditory, visual, and kinesthetic had "homogeneous variants" learning style. This conclusion can be seen from the result of calculation of value of $\text{Sig} = 0.070 > \text{value critic } 0.05$.

From the source of variation learning style, it was obtained the value of $\text{sig}.0.000 < \text{value critic } 0.05$, Hence, it can be concluded that students' with type of auditory learning style, student with type of visual learning style, and student with type of kinesthetic learning style had the ability of solving problem at all of different subject matters of the research or there was difference of ability of solving problem for students who had different learning style. From the source of interaction variation between method and learning style, it was obtained the value of $\text{sig}.0.000 < \text{values critic } 0.05$. Hence, ability of students in solving problem at all of the subject matter of the research was influenced by interaction between learning method and students' learning style or there was interaction between learning method that was used with students' learning style on learning result of Social Science subject.

3.2. Discussion

The ability of solving problem in each subject matter can be seen in the following table:

Tables 2 The Result of the Ability of Solving Problem in Social Science subject.

No	Subject Matter	Mean PBL	Mean Inquiry
1.	MP 1	6.087	5.380
2.	MP 2	6.847	6.567
3.	MP 3	7.863	7.240
	MP1+MP2+ MP3	20.793	19.187

Based on the table above, it can be compared that the ability of student in solving problem in Social Science subject increased from MP1, MP2 until MP3. This Improvement happened both of students' group who used PBL and inquiry. While, students' ability in solving problem in students' group who used PBL was better than students' group who used inquiry lesson. The difference of ability of students in solving problem between students' group who used PBL and students' group who used inquiry learning was 4.02% seen from the joint of the third subject matter (MP1+MP2+MP3).

Cooperative learning method put the priority on the cooperation in solving problem to apply skill and knowledge in order to reach the target of study. Therefore, cooperative method is suitable with learning Social Science subject. Model of cooperative learning that researcher used in this study was PBL and inquiry. Result of the research at MP1, MP2, and MP3 showed that there was difference of students' learning result in solving problem in Social Science subject between studenta' groups that followed PBL with students' group that followed inquiry learning. Students' group who used PBL learning had ability of solving problem was better than students' group who used inquiry learning.

From the research result, students' learning in solving problem was influenced by students' learning style. This matter showed that students' learning result who had type of auditory learning style was different from student who had type of visual learning as well as students who had type of kinesthetic learning. Learning result of each student in solving problem of students who had type of auditory learning style, student who had type of visual learning as well as student who had type of kinesthetic learning increased starting from MP1, MP2 until MP3. But the increase of each student was different to each type of students' learning style. According to result of research, it was found

that there was difference of result in learning Social Science subject on student who had different learning style. It can be seen in the following table:

Tables 3 Mean of Students' Learning Style of each Subject Matter.

No	Subject Matter	Mean of Auditory	Mean of Visual	Mean of Kinesthetic
1.	MP1	5.955	5.885	5.360
2.	MP2	6.760	6.905	6.455
3.	MP3	7.585	7.855	7.552
4.	MP1+ MP2+ MP3	20.295	20.645	19.990

From the table above, it can be seen that at subject matter 1 (MP1), in PBL learning and inquiry, student with type of auditory learning had better result. This matter happened because in learning of subject matter 1, students just recognized PBL learning and inquiry. In the first learning, teacher still gave many explanations to both of PBL and Inquiry group, so that at the first time, students with auditory learning style is more profitable than those who had visual and kinesthetic learning style. The characteristic of auditory learning style really put listening as the main tool to absorb knowledge or information. In subject matter 2 (MP2), students had type of visual learning style had better ability in solving problem. In subject matter 3 (MP3), students who had type of visual learning style had better ability in solving problem as well, But as a whole result of ANAVA alliance of MP1, MP2, and MP3, and using both PBL and Inquiry learning, students with type of visual learning had better ability in solving problem when compared to students with type of auditory learning or students with type of kinesthetic learning .

From the result of research at the subject matter 1, it indicated that there was no interaction between learning method that was used on learning result of Social Science subject ($p = 0.910 = 0,05$). Result of ANAVA subject matter 2 ($p = 0.000 = 0,05$) and subject matter 3 ($p = 0.002 = 0,05$) showed that there was interaction between learning method and students' learning style on students' learning outcomes in Social Science subject. Because research of MP 1 was different from research result of MP 2 and MP 3, so researcher held a research as a whole that was checking result of students' learning in solving problem by summing the result of students' ability in solving problem starting from MP 1, MP 2, and MP 3. Result of ANAVA alliance of MP 1, MP 2, and MP 3 obtained ($p =$

0.000 = 0,05), so that it was concluded that there was interaction between the methods used and learning style on students' learning outcomes in Social Science subject

4. Conclusion and Suggestion

4.1. Conclusion

Based on the result of the research on students' learning outcomes in Social Science subject through learning method of PBL and inquiry learning for students of Class VII State Junior High School (SMPN) 1 and SMPN 2 Tanah Merah Bangkalan, it can be taken the following conclusions: (1) PBL Learning was better than inquiry learning to be applied in learning of Social Science subject because it could improve students' learning outcomes, (2) Students' different learning style (auditory, visual, and kinesthetic) had influence on students' learning result in solving problem in Social Science subject, and (3) Interaction of learning method (PBL and inquiry) and students' learning style (auditory, visual, and kinesthetic) had effect on students' learning result of Social Science subject. PBL learning methods was proven to be very appropriate for the students with type of visual learning, and inquiry learning method was found to be very suitable for the students' with type of auditory learning style.

4.2. Suggestion

Some suggestions can be raised according to conclusion as follows:

First, learning using PBL method can be viewed as invention method through group work that gives more an opportunity to students in group by investigating, finding and solving problem. In this implementation, teacher should always monitor and guide students to be active in the learning process.

Second, teacher is expected to not disregard the type of students' learning style because it has important role to determine learning method for the success of the teaching learning process.

Third, learning style influences learning result, so it is suggested that before doing teaching, teacher should conduct a preliminary test in determining students' learning style. Hence, it can provide a great opportunity to have better learning result.

Fourth, for the student who has visual learning style, teacher could use PBL method because with this method of visual, student can visualize and compare forms in some position to understand the materials.

Fifth, for student who has auditory learning style, teacher could use inquiry learning method, because auditory students are profitable towards the material presented in early learning process.

Sixth, teacher should be able to adjust between learning method with learning style because learning method is clearly related to the learning styles of the students.

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