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THE INFLUENCE OF PROBLEM-BASED LEARNING MODEL WITH INQUIRY APPROACH TO LEARNING OUTCOMES OF GEOGRAPHY IN HIGH SCHOOL

Moh. Zainuddin*[1], Andrinata[2]

[1,2]Social Education Program Study, Institut Studi Islam Sunan Doe

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ABSTRACT

This study aims to determine the effect of a problem-based learning model with an inquiry approach to the geography learning outcomes of class X MA Darussalam Al-Kubro Moyot Islamic Boarding School Foundation, especially in the essential competencies of analyzing natural disaster mitigation and adaptation with geographical studies. The method used is descriptive quantitative. The results of the data analysis of student geography learning scores showed an increase in the average gain of the experimental class from 59.08 to 77.82, with an increase of 18.74. Although the control class also experienced an increase in score of 56.75 to 70.25 with an increase of 13.5, when compared to the experimental class, the increase in the average score of learning outcomes was higher than the increase in the control class. The difference in the increase in the score of the experimental class learning outcomes with the control is 7.57. So, the problem-based learning model with the inquiry approach significantly affects the student learning outcomes of MA Darussalam Al-Kubro Moyot. This is evidenced by the results of calculating the gain score statistic 0.4758 with a standard error of 0.02787 and a mean of 5%. The problem-based learning model with an inquiry approach can improve high school student learning outcomes. Using a problem-based learning model with an inquiry approach can develop character values of tolerance, democracy, communicativeness, self-confidence, and respect for achievement.

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Keywords: Problem Based Learning, Inquiry, Learning Outcomes.

INTRODUCTION

Based on the results of the researchers' initial observations, geography teachers tend to use conventional strategies in delivering learning material during the learning process. Teacher-centered learning (Stephan, 2020). The teacher uses the lecture method more and occasionally asks questions while the students are not ready to accept the lesson, so they only record the facts the teacher explains. This learning makes students only accept and not practice the ability to learn actively. This fact can be seen from the frequent students asking permission to leave during the lesson (Zamora-Polo et al., 2019).

This resulted in the material presented needing to be fully absorbed by students. In the end, it was using the conventional lecture method where the lack of active student interaction resulted in low student learning outcomes or under the minimum completeness criteria (MCC) set by the school at the suggestion of the subject teacher.

As a student guide, the teacher strives to overcome these problems by using various learning models. The learning model used is one of the components in improving students' abilities (Aliman & Astina, 2019; Simamora & Saragih, 2019; Supena et al., 2021). Teachers must be able to choose a learning model that suits the conditions of students. The use of learning models must be related to the reality in the field so that they can train students to be more skilled. Geography subjects have their characteristics.

* **Correspondance Address**
E-mail: muhzainuddin90@gmail.com

These characteristics are related to the concepts of natural phenomena and symptoms. Therefore, learning methods are needed in learning geography to activate students in strengthening cognitive abilities. One of the learning models used in geography is the problem-based learning model. In this model, students can develop problem-solving skills, acting as problem solvers, and in learning processes thinking, group work, communication, and giving to each other are built—information (Chevalier et al., 2020; Permata et al., 2018; Simamora & Saragih, 2019).

Based on the problems above, to overcome student problems, empirical data is needed about the use of learning models that activate students more in learning and are expected to increase the achievement of students' scientific skills (Felszeghy et al., 2019; Serevina et al., 2018; Supena et al., 2021). One learning model that supports active student learning is the PBL model with an inquiry approach, so empirical data is obtained about how the teaching and learning process model is implemented to achieve students' scientific skills.

The same problem was also experienced by Madrasah Aliyah (MA) Darussalam Al-Kubro Moyot, especially in geography learning. Based on the results of observations in March 2022 in class X (ten), the teacher delivered more material using the lecture, question and answer, and assignment methods. Learning with this method prevents all students from participating actively in learning. Besides that, students also seem unwilling to think, which is shown by their indifference to students in learning.

In the 2013 curriculum syllabus for geography subjects, there are essential competencies in analyzing natural disaster mitigation and adaptation with geographical studies, with indicators including according to Demiroz & Haase, (2020) (1) explaining the types and characteristics of natural disasters, (2) showing the distribution of natural disaster-prone areas in Indonesia, (3) assigning examples of natural disaster risk reduction efforts, and, (4) preparing natural disaster management institutions.

This subject matter requires more students to see the state of the environment outside the classroom, so it is very suitable to apply the PBL model with an inquiry approach to help student learning. Based on the background of the problem, the researcher is interested in conducting research with the title "The Influence of Problem-Based Models with Inquiry Approaches on Geography Learning Outcomes at MA Darussalam Al-Kubro Moyot."

LITERATURE REVIEW

The selection of learning models can spur students to be more active in learning. According to Saputra et al., (2019), the teaching model is a teaching plan describing the process taken in the teaching and learning process to achieve specific changes in student behavior as expected. Problem-based learning helps students to develop critical thinking skills and problem-solving skills. According to Luoise, (2019), the application of problem-based learning models is intended to increase student participation and learning achievement because, through this learning, students learn how to use concepts and interaction processes to assess what they know, identify what they want to know, collect information and collaboratively evaluate the hypothesis based on the data that has been collected.

The PBL model can develop students' activeness in investigative activities and develop thinking skills to solve problems. According to Wang et al., (2022), the problem-based learning model is a learning model that is based on many problems that require factual investigation. These, namely investigations, require real solutions to real problems. Likewise, according to Aldayel et al., (2019), the Problem Based Learning model is a learning model that can help students to be active and independent in developing thinking skills to solve problems by searching data so that rational and authentic solutions are obtained.

Characteristics of Problem Based Learning

According to Ariyani & Kristin, (2021), problem-based learning models have the following characteristics:

1. Submit a question or problem. Problem-based learning organizes teaching around social issues that are important to students. Students face real-life situations, try to ask questions related to problems, and allow for various solutions to solve problems.
2. Focuses on interdisciplinary interrelationsh social science education. Even though problem-based learning is centered on specific subjects (science, mathematics, history), the problems studied are accurate to be solved. Students review the problem from various subjects.
3. Authentic inquiry. Problem-based learning requires students to conduct authentic investigations to find real solutions to real problems. Students must analyze and define problems, develop hypotheses and predictions, collect and analyze information, carry out experiments (if needed), and draw conclusions.
4. Produce products and publish. Problem-based learning requires students to produce specific products in the form of real works or demonstrations that can represent the solutions to the problems they find.
5. Collaboration. Problem-based learning is characterized by students working together, often forming small group pairs. Working together motivates them to continue with more complex assignments and enhances the development of social skills.

Based on the descriptions of several experts, the characteristics of problem-based learning models emphasize efforts to solve problems. Students must actively seek information from all sources related to the problems faced. The results of student analysis will be used as a solution to problems and communicated.

Combination of Problem Based Learning with Inquiry Approach

The PBL model is a model that requires students to solve a problem which is the topic of learning. In the essential competencies of analyzing natural disaster mitigation and adaptation with geographical studies, one phenomenon that occurs around the MA Darussalam Al-Kubro Moyot school environment, which is close to the coast, can be taken, namely the problem of beach abrasion. With a learning guide through the PBL model, it will be straightforward for students to solve these problems. This PBL model will later collaborate with the Inquiry approach so that learning activities focus on students thinking critically and analytically to seek and find answers to a problem presented for themselves (Kardipah & Wibawa, 2020; Kawuri et al., 2019; Nurlaily et al., 2019).

Implementing the PBL model with the inquiry approach can be realized by other methods, namely by carrying out experimental activities. Geography learning also often carries out laboratory or field practice activities that indirectly encourage students to conduct experiments to increase their understanding of geography concepts (Munandar et al., 2020). Students can also be trained in the skills that underlie experiments, such as using measuring instruments, choosing the suitable measurement data collection method, processing the measurement data obtained, and so on.

METHOD

This research uses a quantitative approach with the type of quantitative-explanative research. The design used in this study was quasi-experimental. The research design in table 1 was a pre-test and post-test control group design. In this design, the experimental and control groups were both given a pretest and posttest. Both of these groups received the same teaching treatment in terms of objectives and content of learning materials (Albay, 2019). The population in this study amounted to 60 students with class X IPS 1 totaling 32. Meanwhile, class X IPS 2 totaling 28 students.

Table 1. Research Design

Group	*Pre test*	Treatment	*Post test*
Experiment	O_1	x	O_2
Control	O_1	-	O_2

Source: Sugiyono, (2018)

RESULT AND DISCUSSION

The pretest is a set of questions given before learning that are directly related to the knowledge, skills, or attitudes to be learned (Alam, 2019; Evrim & Dadli, 2020). Furthermore, Alam, (2019) explained that the pretest could increase students' sensitivity to the learning situation they will follow. The purpose of the pretest in this study is to measure students' initial abilities related to the learning that will be given so that new learning can improve students' initial abilities beforehand. The results of the students' pretest are presented as an image of the average value as follows in **Figure 1**.

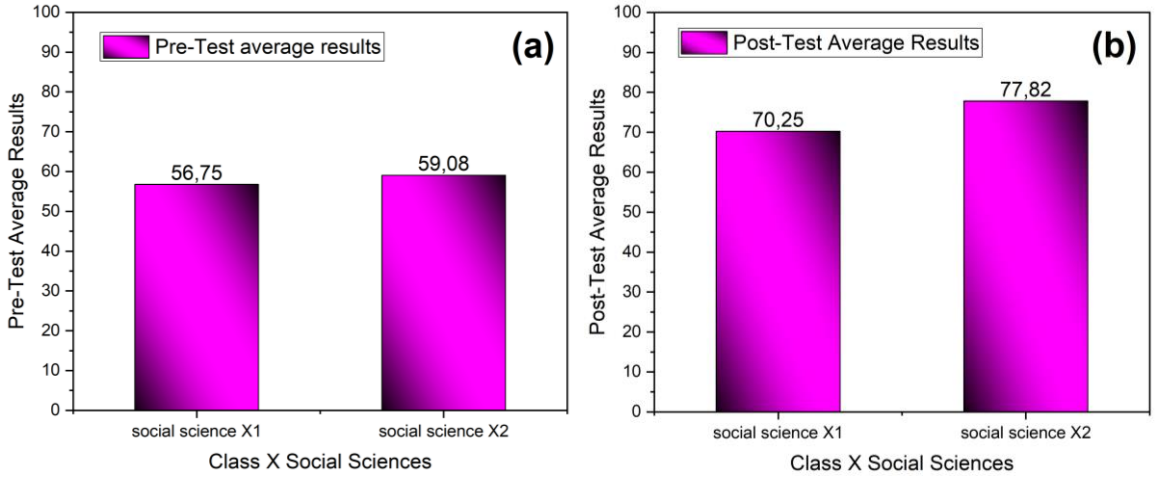

Figure 1. The Average Value of (A) Pre-Test and (B) Post-Test

The posttest here is a set of questions given to class X social science education 1 students after treatment using a problem-based learning model and class X social science education2, which is taught using conventional learning (lectures, question and answer, and discussion). The posttest in this study serves to measure the extent of the effect of a given learning treatment. The results of the post-test measurements that have been carried out are represented using the following figure 1 (bar chart). **Figure 1** (bar chart) above it tells that the average pretest score of class X social science education1 students is lower than the average pretest score of class X social science education two students, namely 56.75 <59.08.

The results of the data analysis of student geography learning outcomes scores showed an increase in the average gain of the experimental class from 59.08 to 77.82, with an increase of 18.74. Although the control class also experienced an increase in score of 56.75 to 70.25 with an increase of 13.5, when compared to the experimental class, the increase in the average score of learning outcomes was higher than the increase in the control class. The difference in the increase in the experimental and control class learning outcomes score is 7.57. So, the problem-based learning model with an inquiry approach significantly affects high school student learning outcomes. This is evidenced by the results of calculating the gain score statistic 0.4758 with a standard error of 0.02787 and a mean of 5% presented in **Figure 2**.

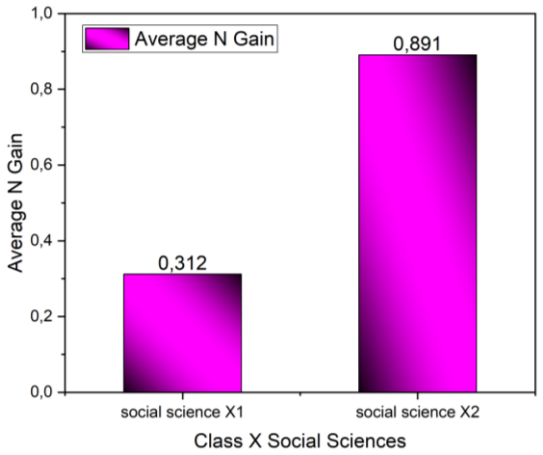

Figure 2. Gain Scores for the Experimental Class and the Control Class

CONCLUSION

The learning outcomes of students who take problem-based learning with an inquiry approach are better than students who take a learning model with lecture and question-and-answer methods. The results of the data analysis of student geography learning scores showed an increase in the average gain of the experimental class from 59.08 to 77.82, with an increase of 18.74.

Although the control class also experienced an increase in score of 56.75 to 70.25 with an increase of 13.5, when compared to the experimental class, the increase in the average score of learning outcomes was higher than the increase in the control class.

The difference in the increase in the score of the experimental class learning outcomes with the control is 7.57. So, the problem-based learning model with the inquiry approach significantly affects the student learning outcomes of MA Darussalam Al-Kubro Moyot. This is evidenced by the results of calculating the gain score statistic 0.4758 with a standard error of 0.02787 and a mean of 5%. The problem-based learning model with an inquiry approach can improve high school student learning outcomes. Using a problem-based learning model with an inquiry approach can develop character values of tolerance, democracy, communicativeness, self-confidence, and respect for achievement.

Author's declaration

Authors' contributions and responsibilities

The authors made substantial contrib-utions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

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