COMPARISON OF PROBLEM-BASED LEARNING AND PROJECT-BASED LEARNING MODELS IN GEOGRAPHY SUBJECTS AT MA PPPI MIFTAUSSALAM BANYUMAS

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ABSTRACT

This study aimed to analyze the differences in the Project Based Learning (PJBL) and Problem-Based Learning (PBL) learning models at MA PPPI Miftahussalam Banyumas on disaster mitigation material. The type of research used in this study was quasi-experimental, with research subjects namely students of class XI MA PPPI Miftahussalam Banyumas, totaling 52 students. This data collection method uses the computational computation of the SPSS program. Data processing for comparison of Project Based Learning and Problem-Based Learning models uses the t-test. The results of the t-test show the value of Sig. (2-tailed) of 0.028 <0.05, it can be concluded that there is a significant difference between the average student learning outcomes with the Project Based Learning and Problem-Based Learning models. The mean difference value is 5.44 which indicates the difference between the average student learning outcomes with the Problem-Based Learning model and the Project Based Learning model or 77.56 – 83 = -5.44. It can be concluded that learning using the Project Based Learning learning model is significantly more effective than using the Problem-Based Learning model.
INTRODUCTION

Indonesia is one of the countries prone to natural disasters. Buchari (2020) states that disasters are one of the phenomena that are often encountered in various countries, especially Indonesia. Indonesia can be said to be one of the countries in Southeast Asia which is prone to natural disasters, because of its geographical location which consists of many islands. In addition, Indonesia is also included in a tropical climate which has two seasons, namely the rainy season and the dry season (Pangaribuan, 2019).

The natural disasters that have occurred in Indonesia have had major impacts on daily life, for example in the economic field the damage to public facilities disrupted people’s economic activities, the social sector which has caused many fatalities, and the education sector. In the field of education, natural disasters have an impact on madrasah buildings and infrastructure, including other madrasa residents.

Based on data from the 2020 Indonesia Disaster Risk Index issued by BNPB, there are 19 provinces that have a high risk of natural disasters, this includes 205 million people exposed to disaster risk with 107 million of them being school-age children. There are around 126,681 education units that are at moderate and high disaster risk (Logayah, et al 2022). Based on these data, integrated efforts and synergy from various parties are needed in an effort to reduce disaster risk in madrasas.

Efforts to reduce disaster risk in the education sector are contained in the Government Regulation concerning the national disaster management policy as stipulated in Law no. 24 of 2007 concerning Disaster Management and Minister of Home Affairs Regulation No. 33 of 2006 concerning General Guidelines for Disaster Management as a reference in knowledge about disaster studies in Indonesia. The Ministry of Education and Culture has developed a disaster risk reduction strategy in schools which is equipped with teaching material modules and training on integrating disaster risk reduction, through the circular of the Minister of Education and Culture Number 70a/MPN/SE/2010.

The circular letter encourages various educational institutions, both schools and madrasas, to organize disaster mitigation education. Disaster literacy is given to minimize disasters by equipping someone with good knowledge, attitudes, and skills to reduce disaster risk. So that the competencies developed are survival skills and expertise in change, conflict, uncertainty, and complexity in life. Based on this, it is hoped that disaster mitigation education can equip students with knowledge and skills in dealing with disasters caused by natural events or not.

In contrast to these expectations, the conditions in the field show that there is still a lack of knowledge and understanding of students regarding disasters. This is shown from the results of research conducted by Logayah, et al (2022), regarding disaster literacy, showing that there is still a lack of knowledge and understanding of students regarding disasters. This is also supported by the results of observations made by researchers at MA PPPI Miftahussalam Banyumas which show a lack of understanding of disaster mitigation material. This can be seen from the average value of the evaluation of disaster mitigation learning for class XI IPS 1 is 42.09 and XI IPS...
is 36.62. Then researchers find out more about the cause of the problem. The results of observations and interviews with geography teachers stated that learning still uses conventional methods or lectures, whereas disaster mitigation material is directed not only to understand but it is hoped that students will have survival skills.

Based on these problems, it is necessary to make efforts to improve student learning outcomes regarding disasters contained in disaster mitigation material. To be able to determine the solution to the problem, the researcher tries to find the cause which is done through observation and interviews with teachers. The results show that learning in the classroom uses conventional or lecture methods. Where this method will be difficult to develop survival skills which are one of the competency materials for disaster mitigation. So one of the efforts to improve the learning outcomes of disaster mitigation materials is to change the learning model that is directed at students having survival skills.

In the 21st century, various effective learning models have been found that are able to maximize the potential of students properly, including; Problem-Based Learning, and Project Based Learning, and Discovery Learning. The PJBL learning model aims to train students to produce a project. Students are trained to develop their skills to include this learning in an innovative learning model. Besides that, PJBL learning can facilitate students to work optimally both individually and in groups.

The PJBL learning model is included in the learning model which uses projects as the medium. Students do some guidance to their teacher related to the project they will do. The description of this learning model is that first, the teacher gives orders/assignments to students to explore, assess, interpret, synthesize, and provide information in producing various forms of learning outcomes. The first step in this study is to use problems as a first step in gathering and interpreting knowledge based on real-life experiences. In line with this, students search for themselves and directly develop the abilities they have based on their respective groups (Surya, 2018).

Eliza (2019) stated several objectives of the PJBL learning model, including, a) increasing students' ability to solve problems related to project problems, b) being able to acquire new knowledge and skills in a lesson, c) being able to induce students to become more active in solving various problems. complex project problems with real product results, d) can improve students' skills in managing materials or tools in completing the project assignment, and e) can train and develop collaboration between students, especially in PJBL which is a group.

Besides that, Rusman (2010) explains the characteristics of the PJBL Learning model, including, a) Content. This activity focuses students' ideas on forming a picture in determining relevant topics based on their experiences in their daily lives; b) Conditions. This activity focuses on encouraging students to learn independently in managing their assignments and study time so that during practice students are used to searching for information with various references that they often do, such as reading more books and expanding internet access; c) Activities. This activity is one of the most effective and interesting activities, this is related to the process of finding answers to the questions they mentioned and solving problems using the skills they have. During the learning process, students must be required and trained to be active, so that they can use their skills in solving problems and various learning objectives to be achieved; and d) Results.

This is related to the application of productive results in assisting students in developing learning skills and being able to integrate them into perfect learning activities including strategies and students' abilities to maximize their cognitive abilities in solving problems. In addition, this trait is also associated with certain skills,
dispositions, attitudes, and productive work so that it can effectively maximize difficult goals. Based on the explanation above, it can be concluded that the PJBL learning model is appropriately applied to disaster mitigation material, in the learning process students are directed to have the right skills and attitudes in dealing with disasters.

Rossana (2019) states that it is very important for teachers to improve the quality of learning for their students by paying attention to learning models that make maximum use of technology. Teachers can use learning models that can relate material to everyday life. One of them is the problem-based learning model or commonly called PBL. This learning model focuses on students on relevant issues by using all their knowledge. Besides that, problem-based learning is included in the learning model that begins with problems in gathering and integrating new knowledge. In solving these problems, students will gain the knowledge and skills needed for these problems. This learning model starts from the learning process by defining the problem, after which students carry out discussions in equating perceptions of the issues discussed, designing goals and targeting things to be achieved.

Next is to search for materials from various sources, this search is like books related to the topic of the problem, journals related to the topic of the problem, and any material that can be used as reference material. This problem-based learning model is not only focused on student learning outcomes, but the teacher also pays attention to the processes experienced by students during learning takes place. The teacher has a role in monitoring the learning progress of his students in achieving learning goals and always directs his students in solving the problems given so that the teacher can be said to be a bridge for the solutions faced by his students (Agustin, 2013., & Fauzia, 2018).

There are several characteristics of the PBL (problem-based learning) model including a) this learning applies contextual learning, meaning that students do not only understand the material for the problems given but also associate it in real everyday life so that students solve problems based on real experience; b) the problems presented can motivate students to always learn; c) this learning model is also included in motivated learning with unlimited problems; d) students are trained to always be active in class learning; e) students are also trained to be able to work collaboratively by having various skills, these skills are expected to help students in solving the problems they face; and f) students in solving problems do not only use knowledge and skills but also use experiences in their daily lives by understanding various existing concepts.

Basically the PBL learning model or commonly referred to as problem-based learning aims to enable students to solve problems so that students are trained and accustomed to critical thinking and high-level thinking (Nurhayati, 2015). Based on the description above, it can be concluded that the expectations of the PBL model in this geography lesson can develop critical thinking patterns and analysis as well as confront students in practice to solve individual and social problems. This matter because the Problem-Based Learning model in its implementation is characterized by there are problems in everyday life that are specifically designed to be able to stimulate and involve students in problem-solving patterns.

Researchers hope that these learning models can improve learning outcomes so that learning objectives can be achieved. Teaching objectives are objectives that describe knowledge, skills, and other things that must be possessed by students as a result of teaching results expressed in the form of observable and measurable behavior. Therefore, in formulating instructional objectives, efforts must be made to make it appear that after achieving these goals there has been a change in the student’s self which includes intellectual abilities, attitudes, and skills.

According to Soedijarto (2017: 36), learning outcomes are mastery behaviors achieved by students in
participating in teaching and learning programs in accordance with the set educational goals. The intended learning outcomes include cognitive, affective, and psychomotor areas. The problems studied are related to students' different understanding, especially in terms of calculations. Basically, the cognitive aspects of students with an IPS background are different from students with a science background. For science students, they are more accustomed to calculations without memorizing as long as they understand the formula, but for Social Sciences students have to slowly, besides having to know the development of social sciences they also have to understand economic values that can be applied in everyday life. Therefore their learning outcomes also vary. In line with that, Snelbeker (2017: 8) says that in the context of evaluating learning outcomes, there are three domains or target directions that are necessary for each learning outcome evaluation activity. The three domains or domains in the CBC Curriculum or the 2004 Curriculum (Ministry of National Education, 2003) are termed affective competence, cognitive competence, and psychomotor competence.

**METHOD**

This study uses a quasi-experimental method. The implementation of this research is based on the consideration that learning takes place naturally, students do not feel that they are being experimented with so that this situation is expected to contribute to the level of validity and research. where the research objective is directed to determine the effect due to certain treatments on other variables under controlled conditions (Sugiyono 2011: 72). In the field of education, experimental research conducted outside the laboratory has several advantages. According to Sukardi (2011: 180), several advantages possessed by research outside the laboratory, namely experimental variables can be stronger, giving treatment is easier, the settings carried out can be close to the actual situation, and the experimental results are more actual.

This research was conducted at MA PPPI Miftahussalam Banyumas in class XI which consisted of students from class XI IPS and XI IPA, totaling 52 students. In class, XI Social Sciences, the experimental class I applied the Problem-Based Learning model, and XI IPA as the experimental class II applied the Project Based Learning model. Data collection techniques using observation and documentation. Observation techniques are carried out by observing student learning activities. The documentary technique in question is perpetuating the research process in the form of photographs and files that support research.

The research data analysis technique begins with compiling the learning outcomes of disaster mitigation using the conventional model, then comparing them with the learning outcomes of the Project Based Learning and Problem-Based Learning models using a different test (t-test). After the different tests have been carried out, the effectiveness of the Problem-Based Learning and Project Based Learning learning models can be measured on disaster mitigation material.

**RESULT AND DISCUSSION**

**Student Learning Outcomes Using Problem-Based Learning Learning Model**

The Problem-Based Learning (PBL) learning model is applied in class XI IPS to find out student learning outcomes on Disaster Mitigation material. Based on the descriptive statistical analysis, it is known that the highest score is in class XI IPS using the problem-based learning model, namely 92, which has a frequency of 1 student or 4%. There is 1 student who gets the lowest score of 60 with a percentage of 4%. It is also known that students who use the problem-based learning model obtain an average score of 77.56. Based on the standard categorization set by the Ministry of Education and Culture, the average value of 77.56 is included in the category
Based on the research results, it is known that after being given learning using the problem-based learning model, it shows that student learning outcomes on Disaster Mitigation material are better than using conventional models. This is shown in the average value of the XI IPS class using the conventional model which is still low, namely 42.09. The increase in the average score occurred after learning using the problem-based learning model in class XI IPS which obtained an average score of 77.56.

This shows that students' understanding of disaster mitigation material is better when using the problem-based learning model compared to using conventional models. With a better understanding, students can increasingly contribute to disaster risk reduction in schools and make students more resilient in dealing with disasters.

The above results are following Piaget's theory of cognitive development that children grow and acquire more language, have memory capacity, have complex mental representations, and abstract about the world. The cognitive constructivist perspective is the foundation of problem-based learning. Piaget stated that good pedagogy involves children experimenting, manipulating things, asking questions, and looking for answers themselves, comparing findings with their experiences and comparing their findings with the findings of other children.

In line with this, the above results are also in accordance with Vygotsky's social learning theory of constructivism that Vygotsky is more concerned with social aspects of learning because social interaction can bring up new ideas in increasing individual intellectuality. Education according to Vygotsky's ideas occurs through social interaction between students, educators, and peers with appropriate challenges and proximal development where new learning takes place. Besides that, these results are also in accordance with Bruner's theory and Discovery Learning, in which Jerome Bruner and his colleagues explained the importance of being known as discovery learning. Bruner provides an overview of assistance that can help a student understand a problem beyond his development capacity and is assisted by educators or people who are professionals in the problem area being studied. Bruner believes social interaction both inside and outside school can provide understanding or mastery of language and behavior in solving student problems.

The results of this study are in line with John Dewey's theory that John Dewey has the view that school is a reflection of a very large society and the classroom is a laboratory for conducting investigations and solving problems in real-world life. John Dewey's teaching theory encourages educators to involve students in problem-oriented projects and helps students to investigate social issues and intellectual importance. The vision of learning has a goal or is centered on problems with the encouragement and desire of students to understand learning situations that are personally meaningful, clear, and relate to contemporary problem-based learning with Dewey's philosophy of education and teaching.

**Student Learning Outcomes Using Project-Based Learning Learning Model**

The Project Based Learning (PJBL) learning model is applied in class XI IPA to find out student learning outcomes on Disaster Mitigation material. Based on the descriptive statistical analysis it is known that the highest score in class XI IPA using the project-based learning model is 95 which has a frequency of 4 students or 14.8%. There is 1 student who gets the lowest score of 65 with a percentage of 3.7%. It is also known that students who use the project-based learning model get an average score of 83. Based on the standard categorization set by the Ministry of Education and Culture, the average score of 83 is included in the category of very high learning outcomes.
Based on the research results, it is known that after being given learning using the Project Based Learning model, it shows that student learning outcomes on Disaster Mitigation material are better than using conventional models. This is shown in the average value of class XI IPA using the conventional model which is still low, namely 36.62. The increase in learning outcomes for class XI IPA occurs after learning uses the Project Based Learning model which gets an average score of 83.

This shows that students' understanding of disaster mitigation material is better when using project-based learning models compared to using conventional models. With a better understanding, students can increasingly contribute to disaster risk reduction in schools and make students more resilient in dealing with disasters.

Comparison of Problem-Based Learning Learning Models with Project-Based Learning Learning Models on Disaster Mitigation Materials

A comparison of learning models is done by measuring the effectiveness of the Problem-Based Learning (PBL) and Project Based Learning (PJBL) learning models in learning Disaster Mitigation material. Measuring effectiveness is done by using the t-test.

<table>
<thead>
<tr>
<th>Model</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning</td>
<td>PBL</td>
<td>25</td>
<td>77.56</td>
<td>8.088</td>
</tr>
<tr>
<td>Outcomes</td>
<td>PJBL</td>
<td>27</td>
<td>83.00</td>
<td>9.106</td>
</tr>
</tbody>
</table>

From the table, it can be seen that the amount of data on learning outcomes with the Project Based Learning (PBL) model is 25 students, while the Project Based Learning (PJBL) model is 27 students. The average value of student learning outcomes with the PBL model is 77.56, while with the PJBL model, it is 83. Descriptively statistically it can be concluded that there is a difference in the average student learning outcomes between the PBL and PJBL models. Where the average score of students in class XI IPA using the Project Based Learning (PJBL) learning model is higher than that in class XI IPS using the Problem-Based Learning (PBL) learning model.

To prove whether the difference is significant or not, an analysis of the output of the Independent Sample Test can be carried out. The results of the analysis show that the value of Sig. (2-tailed) of 0.028 <0.05, it can be concluded that there is a significant difference between the average student learning outcomes with the PBL model and the PJBL model. The mean difference is -5.44, indicating the difference between the average student learning outcomes with the PBL model and the PJBL model or 77.56 – 83 = -5.44. It can be concluded that learning using the Project Based Learning (PJBL) learning model is significantly more effective than using the Problem-Based Learning (PBL) model.
CONCLUSION

Based on the research results, it is known that after being given learning using problem-based learning and project-based learning models, it shows that student learning outcomes on Disaster Mitigation material are better than using conventional models. This is shown in the average grades of XI IPS and XI IPA using conventional models which are still low, namely 42.09 and 36.62. The increase in the average score occurred after learning using the problem-based learning model in class XI IPS which obtained an average score of 77.56. The same thing is also shown in the learning outcomes in class XI IPA after using the project-based learning model, which gets an average score of 83.

Based on the results of the t-test, it can be concluded that there is a significant difference between the average student learning outcomes with the PBL and PJBL models. This is shown by the value of Sig. (2-tailed) of 0.028 < 0.05. The mean difference value is -5.44, which indicates the difference between the average student learning outcomes between the PBL model and the PJBL model, or 77.56 – 83 = -5.44. It can be concluded that learning using the Project Based Learning (PJBL) learning model is significantly more effective than using the Problem-Based Learning (PBL) model

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