



## Comparative Study of Economic Learning Outcomes Using Problem Based Learning and Project Based Learning Models by Considering Student Learning Activities

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### Abstract

This study aims to explore the effectiveness of problem-based (PBL) and project-based (PjBL) learning models on students' economic learning outcomes with different learning activity levels. Using a quasi-experimental method with a 2x2 factorial design and a purposive sample of 67 students, data were collected through interviews, observations, documentation, tests, and experiments. Hypothesis testing was done with two-way ANOVA and t-test of two independent samples. The results showed no significant difference in economic learning outcomes between PBL and PjBL models. However, there was a significant difference between students with high and low learning activities. The average learning outcomes of students with high learning activities were better using PjBL, while students with low learning activities were better using PBL. There was no significant interaction between learning models and learning activities on economic learning outcomes. This research provides important insights for educators in choosing the appropriate learning model to improve economic learning outcomes.

## INTRODUCTION

Education is one of the important aspects of human life that must be fulfilled. Education is an effort made by each individual to gain knowledge in order to develop their potential. Through education, it can improve the personality, intelligence and skills of individuals. So that with education, it can produce resources that are superior, have character, and have broad insight. Broadly speaking, education is divided into three types, namely formal, non-formal and informal education. Formal education is a structured and tiered educational process carried out in school institutions (Anwas, 2013). Schools are one of the formal educational institutions that have a very important role in producing quality students (Maulidia et al., 2019). Educational institutions such as schools have an important role in carrying out the educational process.

In the learning process, there are often several problems that can affect the achievement of learning objectives. One of the problems in the learning process is the lack of teacher creativity in applying and developing learning models that are relevant to the subject matter. Educators or teachers' efforts that can be done to improve student learning activities and outcomes are by using various learning methods (Linawati, 2017). The selection of suitable learning models and methods also determines learning outcomes because methods and models are a process in learning (Maizeli & Nerita, 2015). The application of various learning models during the learning process aims to increase interest, increase activeness, and improve learning outcomes. To achieve good learning outcomes is certainly inseparable from the factors that influence it.

Based on the data from the midterm assessment results, the number of students who obtained scores above the KKM was less than the number of students who obtained scores below the KKM. Then based on the results of preliminary research and interviews that have been conducted at SMAN 15 Bandar Lampung, it is known that the learning process is still teacher centered. Teacher-centered learning, students are more likely to be silent, even the competencies taught have not been absorbed properly

(Nurtanto & Fawaid, 2015). This causes some students not to pay attention and some students chat during the learning process, so that most students' learning outcomes have not reached the minimum completeness criteria (KKM). Low learning outcomes indicate that educational goals have not been achieved. Whether or not the achievement of educational goals is successful depends on how students go through the learning process. In learning activities, there are many factors that influence it. There are factors that affect learning outcomes, both from within students and from outside students.

The selection or application of learning models can be one of the factors that affect learning outcomes. The use of direct methods or lectures causes the teacher's role to be very dominant so that student participation and activeness are limited during the learning process. The application of this method is considered less effective and efficient for the implementation of learning because it cannot stimulate students' interest and motivation to learn. Because learning with the lecture method in practice is led by the teacher, so students tend to be less active and passive (Mahmudah, 2016). One learning approach that can be applied to improve student learning outcomes is to use a scientific approach (Putri, 2019). The scientific approach is one of the student-oriented or student-centered learning approaches (Yerimadesi et al., 2016). Learning models that are in accordance with the scientific approach include: inquiry-based learning, discovery learning, problem-based learning, and project-based learning (Nurtanto & Fawaid, 2015). In this study, researchers applied two learning models, namely the problem-based learning (PBL) model and the Project-based learning (PjBL) model. The selection of the two models is because PBL and PjBL models are thought to improve student learning outcomes.

Problem-based learning (PBL) is learning that is centered on students with a problem approach to analysis, solving problems generated by analysis, and discussing the problems given, problem solving and critical thinking in the actual context is something that is emphasized in learning with the Problem-based learning model (Qalbi & Saparahayuningsih, 2021). Through this model, students will be exposed to practical problems. In this learning model, the teacher is given space only as a facilitator, while students are encouraged to play a more active role in the learning process (Sari et al., 2022). Learners can learn to solve a problem then they will apply the knowledge they have or try to find out the necessary knowledge so that learning can be more meaningful and can be expanded when students are faced with situations where concepts are applied (Maryamah et al., 2016). According to (Marpaung & Sutiani, 2020) the use of problem-based learning models affects learning outcomes. Problem-based learning emphasizes learning as a process that involves problem solving and critical thinking. This can stimulate students to be more active in learning so that it can increase understanding and learning outcomes achieved (Glazer in Suswati, 2021).

Project-based learning (PjBL) is a learning model that involves students to work on a project that is useful for solving community and environmental problems (Sani in Adiyah, 2019). This learning model is innovative and student-centered where students will be faced with problems that occur in the real world and asked to solve these problems in their own way (Khairiah, 2015). Project-based learning focuses on student activities in the form of gathering information and utilizing it to produce something that is useful for the student's own life and for others. This learning model can make students more productive, innovative and creative so that the use of this project-based learning (PjBL) learning model can affect student learning activities and outcomes (Nurhadiyati et al., 2021).

In addition to the learning model used, learning activities are also one of the factors that affect learning outcomes. This activity is an effort to support students in their efforts to improve learning outcomes in class and at home. This activity can determine the success or failure of a student's learning. The higher the student activity in learning, the faster the student's understanding of the subject matter. Learning activities are student activities that support successful learning. For an effective learning process, good learning activities are needed in order to have a good influence on student learning outcomes (Rina et al., 2021). Activity and learning outcomes play an important role in the learning process and are interrelated. While at school, students carry out various activities in their learning activities, including writing, reading and listening to the teacher. Therefore, the application of problem-based learning (PBL) and project-based learning (PjBL) models is needed to improve learning activities.

Based on the description above, the purpose of this study is to examine whether or not there are differences in economic learning outcomes using problem-based learning models and project-based

learning models, whether or not there are differences in the economic learning outcomes of students whose learning activities are high with students whose learning activities are low, the effectiveness between problem-based learning models and project-based learning on the economic learning outcomes of students with high and low learning activities, and whether or not there is an interaction between learning models and learning activities on students' economic learning outcomes.

## METHODS

This research uses a quasi-experimental method with a comparative approach. In this study, the experimental design used was Factorial Experimental Design or also known as factorial design. The experimental design used is a 2x2 factor design. The use of 2x2 factorial research design, aims to see the effectiveness of the treatment of two models of Problem Based Learning and Project Based Learning with the main objective of comparing treatments and seeing whether or not there are differences in Economic Learning Outcomes Using Problem Based Learning Models and Project Based Learning Models with moderating Learning Activities when the experimental process is applied. data collection techniques in this research use interviews, observations, documentation, tests and experiments. The population used in this study were class X students of SMAN 15 Bandar Lampung totaling 307 students. The sampling technique used was purposive sampling. Hypothesis testing technique using Two-way ANOVA and t-test of two independent samples.

## RESULTS AND DISCUSSION

### A. Result

The results in this study include the results of hypothesis testing consisting of two-way ANOVA tests and t-tests of two independent samples. The first hypothesis is to determine whether or not there is a difference in economic learning outcomes using a problem-based learning model and a project-based learning model which is analyzed using a two-way ANOVA test with the help of SPSS 26, while the test results can be seen in the following table:

**Table 1. The results of the two-way anova test of the average difference in economic learning outcomes taught using the problem-based learning and project-based learning models.**

Tests of Between-Subjects Effects						
Dependent Variable: Learning Outcome						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	984,642 <sup>a</sup>	3	328,214	3,503	,020	
Intercept	347922,353	1	347922,353	3713,816	,000	
<b>Learning Model</b>	<b>210,145</b>	<b>1</b>	<b>210,145</b>	<b>2,243</b>	<b>,139</b>	
Learning Activities	586,640	1	586,640	6,262	,015	
Learning Model * Learning Activities	265,598	1	265,598	2,835	,097	
Error	5902,044	63	93,683			
Total	366416,000	67				
Corrected Total	6886,687	66				

a. R Squared = ,143 (Adjusted R Squared = ,102)

Based on the table above, it shows that the coefficient value  $F_{hitung} < F_{tabel}$  or  $2.243 < 3.99$  and the Significance value is 0.139 or  $(0.139 > 0.05)$  so that  $H_0$  is accepted, which means that the decision of hypothesis 1 is that there is no difference in the average economic learning outcomes of students taught using the problem-based learning model with students taught using the project-based learning model.

The second hypothesis is to determine whether or not there is a difference in the economic learning outcomes of students whose learning activities are high with students whose learning activities are low which are analyzed using the two-way anova test with the help of SPSS 26, while the test results can be seen in the following table:

**Tabel 2. The results of the two-way anova test for differences in the economic learning outcomes of students whose learning activities are high with students whose learning activities are low.**

Tests of Between-Subjects Effects					
Dependent Variable: Learning Outcome					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	984,642 <sup>a</sup>	3	328,214	3,503	,020
Intercept	347922,353	1	347922,353	3713,816	,000
Learning Model	210,145	1	210,145	2,243	,139
<b>Learning Activities</b>	<b>586,640</b>	<b>1</b>	<b>586,640</b>	<b>6,262</b>	<b>,015</b>
Learning Model * Learning Activities	265,598	1	265,598	2,835	,097
Error	5902,044	63	93,683		
Total	366416,000	67			
Corrected Total	6886,687	66			

a. R Squared = ,143 (Adjusted R Squared = ,102)

Based on the table above shows that the value of  $F_{count} > F_{table}$  or  $6.262 > 3.99$  and the value of Sig. 0.015 or  $(0.015 < 0.05)$  thus  $H_0$  is rejected and  $H_1$  is accepted which means the decision of hypothesis 2 is that there are differences in the economic learning outcomes of students whose learning activities are high with students whose learning activities are low.

The third hypothesis is to determine whether or not there is an interaction between the learning model and learning activities on students' economic learning outcomes which are analyzed using the two-way anova test with the help of SPSS 26, while the test results can be seen in the following table:

**Table 3. Two-way anova test results of interaction between learning models and learning outcomes**

Tests of Between-Subjects Effects					
Dependent Variable: Learning Outcome					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	984,642 <sup>a</sup>	3	328,214	3,503	,020
Intercept	347922,353	1	347922,353	3713,816	,000
Learning Model	210,145	1	210,145	2,243	,139
Learning Activities	586,640	1	586,640	6,262	,015
<b>Learning Model * Learning Activities</b>	<b>265,598</b>	<b>1</b>	<b>265,598</b>	<b>2,835</b>	<b>,097</b>
Error	5902,044	63	93,683		
Total	366416,000	67			
Corrected Total	6886,687	66			

a. R Squared = ,143 (Adjusted R Squared = ,102)

Based on the table above, it shows that the coefficient value of  $F_{count} < F_{table}$  or  $2.835 < 3.99$  and obtained the value of Sig. 0.097 or  $(0.097 > 0.05)$  means that there is no concurrent or join effect between the learning model and learning activities. Thus  $H_0$  is accepted, which means that the decision to test hypothesis 5 is that there is no interaction between the learning model and learning activities on student learning outcomes in economic subjects.

The fourth hypothesis is that the economic learning outcomes of students whose high learning activities are taught using a project-based learning model are higher than the average economic learning outcomes of students taught using a problem-based learning model analyzed using the t-test of two independent samples with the help of SPSS 26, while the test results can be seen in the following table:

**Table 4. The results of the t-test of two independent samples**

Independent Samples Test					
	F	Sig.	t	df	Sig. (2-tailed)
Learning Outcome	,027	,870	-,140	36	,890

	-,140	35,962	,889
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Based on the table above shows that the Sig value. 0.890 or (0.890>0.05), and the value of tcount < ttable or -0.140 < 2.0281 thus meaning that H1 is rejected and H0 is accepted which means that the average economic learning outcomes of students whose high learning activities are taught using the PjBL model are higher than the average economic learning outcomes of students taught using the PBL model.

The fifth hypothesis is that the average economic learning outcomes of students whose low learning activities are taught using the Project-based learning model are higher than the average economic learning outcomes of students taught using the problem-based learning model which is analyzed using the t-test of two independent samples with the help of SPSS 26, while the test results can be seen in the following table:

**Table 5. The results of the t-test of two independent samples**

Independent Samples Test					
	F	Sig.	t	df	Sig. (2-tailed)
Learning Outcome	,222	,641	2,147	27	,041
			2,135	25,710	,042

Based on the table above shows that the Sig value. 0.041 or (0.041 < 0.05), and the value of tcount > ttable or 2.147 > 2.0518 thus meaning that H0 is rejected and H1 is accepted which means that the average economic learning outcomes of students whose low learning activities are taught using problem-based learning models are higher than the average economic learning outcomes of students taught using project-based learning models.

## **B. Discussion**

### **Differences in economic learning outcomes of students taught using the PBL model with students taught using the PjBL model**

Based on the results of the analysis in the study which shows that there is no difference in learning outcomes between the PBL model and the PjBL model because both have their own advantages and attractions so that they can bring out student learning activities in learning and of course can help improve maximum learning outcomes. Both of these learning models can have a good impact or influence to bring up activeness so that it will provide good benefits to student learning outcomes and can optimally achieve completeness of teaching material (Fahrudin 2015). Based on the research that has been done, the application of PBL and PjBL models both attract students' interest to learn more about the subject matter either from books or other learning sources, thus expanding students' knowledge which requires higher-level thinking. These two models have the same characteristics and objectives, namely a problem-oriented learning model that must be solved by each student so that this will increase the level of critical thinking of students.

Based on the data description of the economic learning outcomes of students taught using PBL learning models and PjBL learning models both belong to the high category. Thus, although there is no difference in the average learning outcomes of students, the application of PBL learning models and PjBL learning models during learning can improve student learning outcomes. This statement is in line with Khairiah (2015) which states that the use of the PBL model to solve problems in learning either in groups or individually so that students understand the subject matter they are learning so that they will experience an increase in learning outcomes. This is also supported by the results of research conducted by Widodo & Widayanti (2013) which shows that using problem-based learning methods can improve learning activities and student learning outcomes. The results of research conducted by Nurhadiyah et al., (2021) show that the use of the PjBL model in learning significantly affects student learning outcomes.

### **The average difference in economic learning outcomes of students whose learning activities are high with students whose learning activities are low.**

Based on the results of the research conducted, it shows that there is a difference in the average economic learning outcomes of students whose learning activities are high with students whose learning activities are low. The more active students are in the learning process, the higher the student activity during the learning process. Learning activities that involve students in actively designing their own knowledge can have a positive impact on learning outcomes. High learning activities can include active participation in class, reading additional materials, and doing extra tasks that support understanding of concepts and actions that support successful learning (Jumarniati & Anas, 2019).

This is in line with what Dewi et al., (2019) revealed that students whose learning activities are high tend to get high learning outcomes as well. This statement is also supported by the results of research conducted by Herzegovina et al. (2021). From the results of the study, the t value was 4.11 and t table was 1.994 or  $t_{count} > t_{table}$ , so it can be said that there is a positive or unidirectional influence between learning activities on learning outcomes.

### **There is no interaction between learning models and learning activities on student learning outcomes in economics subjects.**

Student activity during the teaching and learning process is an indicator of students' desire to learn. High learning activity has a tendency to affect student learning achievement, both in terms of knowledge, attitudes, and skills (Susanti et al., 2020). In the learning process, the activeness of students is very important and needs to be considered by the teacher so that the learning process taken really gets optimal results. The learning model should be able to change student learning activities from passive to active to develop concepts that support students' balance, skills and attitudes (Dewi et al., 2019). Therefore, in organizing the learning process at school, teachers are expected to be able to apply various approaches and learning methods that can develop student activity.

This research is in line with the results of previous research, namely research (Siahaan, 2019), The significance value of the interaction model and the activity obtained is 0.062. Because the significance value is greater than  $\alpha$ ,  $H_0$  is accepted. Thus, it can be concluded that there is no interaction between learning models and activities in influencing geography learning outcomes ( $0.062 > 0.05$ ). Based on the results of the study, although between PBL and PjBL learning models there is no interaction with learning activities, but with high learning activities where students are more trying to be active, focused on paying attention and diligent in the learning process can make PBL and PjBL models proven to increase learning activities in students. Thus, it is very important to choose an effective learning model in order to improve learning activities and student learning outcomes.

### **The average economic learning outcomes of students whose high learning activities are taught using the PjBL model are higher than the average economic learning outcomes of students taught using the PBL model.**

Based on the results of the research that has been done, it shows that the average economic learning outcomes of students taught using the PjBL model are higher than those of students taught using the PBL model for students whose learning activities are high. Students whose learning activities are high when compared to the implementation using the PjBL model with the PBL model the results show that the average economic learning outcomes of students whose learning activities are high using the PjBL model are higher than the PBL model. With this project model students can respond and accept very well, students can overcome learning problems when learning with this learning model (Pratiwi & Setyaningtyas, 2020).

The results of this study are in line with research (Fiana et al., 2019) the results of this study indicate that learning using the PjBL model is better than learning using the PBL model. Based on the results of the comparison of the average posttest scores of the experimental and control classes after being given treatment with the PjBL and PBL models, there is a difference of 6.23. the posttest results in the class using the PjBL model were 85.05 while the average posttest results in the class using the PBL model were 78.82. So it can be concluded that the application of the PjBL model is effective on learning outcomes.

## **The average learning outcomes of students who use PBL model is higher than the average learning outcomes of students who use PjBL model**

Based on the results, it was found that students who actively learn to use the PBL model with PjBL the results showed that the average economic learning outcomes of students who actively learn to use the PBL model is higher than the PjBL model. This is because learning with the PBL model brings students to a critical understanding of the problems faced during the teaching and learning process, which previously students had been divided into study groups to solve problems, find and identify these problems from various sources of information (Robiyanto, 2021). Indirectly, students who are actively learning are students who begin to understand their activities, because in this group it is intended to be able to work together with other students and find or provide solutions to the problems faced.

The results of this study are in line with the results of research Pratiwi et al., (2020), based on the analysis of data obtained  $t_{hitung} > t_{tabel}$  ( $4.81 > 2.01$ ), which means that there are significant differences in the learning process of students in Class X of SMA Negeri 3 in the 2018/2019 learning year range conducted with PBL and PjBL. The results of the analysis of the results of Science Process Performance Assessment of the average value of the student's Science Process Performance conducted with PBL learning model reached 82.5 very good compared to the average value of pjbl class students ' science process performance reached 70.57 very good.

The PBL Model is suitable for making students active in learning activities because the stages in the form of orientation, organization, investigation, presentation, analysis and evaluation will help students in finding and finding their own material or answers learned according to the problems discussed, so as to get a better understanding of learning active, innovative, creative, and provide for students during the learning process (Sriamah et al.), (2020)

## **CONCLUSIONS AND SUGGESTIONS**

### **A. Conclusion**

There are several conclusions from the results of research conducted yaiu (1) there is no difference in the average economic learning outcomes of students who are taught using the PBL model with students who are taught using the PjBL model. This is because students ' learning activities tend to increase in their learning in the classroom using both PBL and PjBL models. (2) there is a difference in the average economic learning outcomes of students whose learning activity is high with students whose learning activity is low. The average economic learning outcomes of students whose learning activity is high tend to be higher than the economic learning outcomes of students whose learning activity is low. (3) there is no interaction between the learning model with learning activities on student learning outcomes in economics subjects. (4) the average economic learning outcomes of students whose learning activities are high in learning using the PjBL model are higher than the average economic learning outcomes of students whose learning uses the PBL model. In other words, because of the high learning activity that is owned so as to get high learning outcomes using the PjBL model. (5) the average economic learning outcomes of students whose learning activity is low learning using PBL model is higher than the average economic learning outcomes of students who are taught using PjBL model. In other words, students with average learning outcomes are low learning activities get high learning outcomes with pembelajarannya using PBL model.

### **B. Suggestion**

Based on the conclusions of the study, it is recommended that educators use problem-based learning (PBL) and project-based learning (PjBL) models flexibly according to the needs of the class. The PjBL Model is more effective for students with high learning activity, while PBL is more suitable for students with low learning activity. Educators need to improve student learning activities through strategies such as group work and active discussions, as well as attending training on the application of PBL and PjBL. Continuous monitoring and evaluation and adjustment of curricula and materials are also essential to ensure the effectiveness of learning and improve student learning outcomes in economics subjects.

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