



The Effect Of The Poe (Prediction, Observation, Explanation) Learning Model On Results Learning Economics For Grade X Students

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Abstract

This study aims to determine the effect of the POE (Prediction, Observation, Explanation) learning model on students' learning outcomes in Economics for Grade X at SMA Swasta Imelda Medan in the 2024/2025 academic year. The study employed a quantitative approach using an experimental method with a pretest-posttest control group design. The research subjects consisted of two classes: class X-B as the experimental group and class X-A as the control group, with a total of 68 students. The research instrument used was a multiple-choice test administered before and after the treatment. The results showed that the average pretest score in the experimental class was 14.85, which increased to 17.24 in the posttest. The average N-Gain score was 0.478 (47.80%), categorized as moderate. The t-test analysis revealed a significance value of $0.000 < 0.05$ and a t-value of 8.162, indicating a significant effect of the POE learning model on student learning outcomes. Additionally, the regression test showed a significance value of $0.001 < 0.05$, confirming the model's significant influence. The average N-Gain in the control class was only 0.208, showing a lower improvement compared to the experimental class. Thus, it can be concluded that the POE learning model has a positive and significant effect on improving students' learning outcomes in Economics

Keywords: learning Model, Predict, Observe, Explain, Learning Outcomes

INTRODUCTION

Science and technology continue to develop over time. This phenomenon creates competition in various aspects of life, including in the field of education. According to Law Number 20 of 2003 concerning the National Education System, Article 3, "National education functions to develop abilities and shape the character and civilization of a dignified nation in developing the nation's intellectual life, aiming to develop the potential of students to become human beings who believe in and fear God Almighty, have noble morals, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens" (Juniwati, 2020).

Education is a crucial aspect of human resource development, as it empowers individuals to develop their potential and achieve success in various fields. One of the primary goals of the education system is to improve student learning outcomes, encompassing conceptual understanding, skills, and attitudes aligned with the

competencies expected in the curriculum. In formal education, student learning outcomes are considered successful when students achieve the desired competencies, reflecting their ability to master the material (Dina Juliana Safitri, 2024).

In general, a learning model is crucial for assisting teachers in the learning process, ensuring that learning objectives are achieved as desired. However, many challenges remain in efforts to improve the quality of learning and student learning outcomes (Sinulingga & Sudjiman, 2022) . Some frequently encountered problems include a lack of student engagement in the learning process, low learning motivation, and difficulty understanding the material being taught. Therefore, selecting a learning model is crucial for improving the quality of learning and student learning outcomes (Sebayang, 2022).

Based on initial observations conducted by researchers at Imelda Private High School, Medan, through interviews with Economics teachers, it was stated that student learning outcomes in the Economics subject were still less than optimal and student learning behavior was still poor because there were still students who were not disciplined in doing assignments and often did not focus and were sleepy during the teaching and learning process (Astuti, 2022) . This can be seen from the list of KKM (75) scores for students at Imelda Private High School, which can be seen in the table below:

Table 1. List of students who have and have not met the Minimum Competency Criteria (KKM) at Imelda Private High School for the 2024/2025 academic year.

No.	Class	Number of students	Minimum Competency (KKM)	Students who achieve KKM		Students who do not achieve the KKM	
				>75	%	<75	%
1.	XA	32	75	24	75%	8	25%
2.	XB	34	75	14	43.75%	20	62.5%
3.	XC	33	75	18	54.54%	15	45.45%
4.	XD	32	75	15	46.87%	17	53.12%
5.	XE	32	75	16	50%	16	50%

Based on the table, it can be seen that the highest completion rate is in class XA, students who achieved the KKM were 24 students (75%) out of a total of 32 students, while the lowest score was in class XB, only 14 students (62.5%) out of a total of 34 students in the class (Winagari, Fradani, & Amin, 2025) . From the above problems, to overcome this, the researcher suspects that one solution that can be done is by using the POE (*prediction, observation, explanation*) learning model . Because basically this learning model encourages students to play an active role in the learning process. When students are asked to predict and observe first, they will start to think critically (Marbun, Perangin-angin, Rozi, Manurung, & Siregar, 2025) . This process makes students more focused and enthusiastic because they feel directly involved in learning, not only as recipients of information but active students and participate (Wulandari, Anwar, & Savalas, 2022) . Thus, learning will

become more engaging and meaningful. The POE learning model is expected to be an effective tool for improving overall student learning outcomes (Djumadi & Santoso, 2024) .

Based on these reasons, the author is interested in conducting research entitled "The Effect of the POE (*Prediction, Observation, Explanation*) Learning Model on the Economics Learning Outcomes of Class X Students at Imelda Private High School"

METHOD

This type of research is experimental research using a quantitative approach. Experimental research aims to examine the effects of a particular treatment. In this study, two classes were selected. One class served as the experimental group, receiving the treatment and being taught using the POE learning model. The other class served as the control group, not receiving the treatment, and thus served as a comparison for the results obtained from the experimental group (Kafiliani, Suryawan, Triana, & Salsabila, 2023) .

This research uses a true experimental design, which is an experimental research design that examines the possibility of cause and effect between the group given treatment (experimental group) and the control group (not given treatment) and then compares them (PUTRI, 2021).

This study used a pretest-posttest control group design. This design includes a pretest before treatment and a posttest after treatment in two different groups: the experimental group and the control group. This model allows for comparison between the initial and final conditions after the POE learning model was implemented in the experimental class, while the control class did not use the model (AFIF, 2019) .

This research was conducted at Imelda Private High School, Medan, Jl. Bilal No. 48, Pulo Brayan Darat I, Medan City, North Sumatra. This research will be conducted on grade X students of Imelda Private High School, Medan, in the 2024/2025 academic year. According to (Fara, 2022) Population is a generalization area consisting of objects/subjects that have certain quantities and characteristics determined by the researcher to be studied and then conclusions drawn. Therefore, the population in this study is all students from grades XA to XE at SMA Swasta Imelda Medan in the 2024/2025 academic year, with a total number of grade X students of 163 people.

A sample is a portion of a population used to represent a study and should accurately reflect the characteristics and size of that population. The technique used in determining the sample is purposive sampling or direct appointment (Risa Umami & Fadila Soraya Zaenudin, 2024) , explaining that purposive sampling is a sample selection technique carried out by considering certain criteria. The selection and grouping of classes are carried out based on certain considerations relevant to the research objectives. In this study, students were divided into two groups, namely the experimental class and the control class. After grouping, it was determined that class XB, consisting of 32 students, was the experimental class, while class XA, with 34 students, was designated as the control class (ELSA, 2021).

The reason for selecting class XB as the experimental class is because there are still students whose scores are below the Minimum Competency (KKM), so special efforts are needed to improve their understanding and learning outcomes through more effective learning approaches or methods. Meanwhile, the reason for selecting class XA as the control class is because the average scores of students in this class tend to be more stable and the majority of students have achieved the Minimum Competency (KKM), so this class can be used as a comparison to assess the effectiveness of the learning methods applied in the experimental class (Ghlae, 2022) . In this study, data analysis is a very important step. Data analysis is an activity after data from all respondents or other data sources are collected and then conclusions are drawn (Shofa, Priyono, & Afifah, 2022).

RESULTS AND DISCUSSION

Description of Research Results

This research was conducted on May 19 to 20, 2025, 2024/2025 academic year, this research was conducted to determine learning outcomes of class XA and XB students at Imelda Private Senior High School (SMAS) Medan through the application of the POE learning model (*prediction, observation, explanation*) . This type or design of research uses an experiment where there are experimental and control classes, namely the treatment of the experimental class with the POE learning model (*prediction, observation, explanation*) and the control class using the lecture method. To determine the improvement in students' economic learning outcomes through pretest and posttest. Student learning outcomes are carried out with a simple regression test, a test of the significance of the regression coefficient and a learning outcome test given through *N-Gain*. to determine whether there are significant differences and to what extent the improvement in learning outcomes before and after treatment is given to the experimental class and the control class.

To find out the summary of the research variable data, the following is a basic statistical analysis, namely descriptive statistics of statistical learning outcomes processed using *the SPSS* version 26 application with real data collected by researchers using learning outcome tests in both the experimental and control classes before and after treatment, as well as before and after learning, as shown in the following table:

Table 2. Summary of Experimental Research Data Description

Descriptive Statistics		Experiment		
		Pretest	Posttest Experiment	Valid N (listwise)
N	Statistics	34	34	34
Range	Statistics	12	8	
Minimum	Statistics	6	13	
Maximum	Statistics	18	21	
Sum	Statistics	505	586	
Mean	Statistics	14.85	17.24	

	Std. Error	.390	.330
Standard Deviation	Statistics	2,271	1,924
Variance	Statistics	5,160	3,701
Skewness	Statistics	-2,313	-.166
	Std. Error	.403	.403
Kurtosis	Statistics	7,082	.300
	Std. Error	.788	.788

Statistical data shows the results of the pretest and posttest in the experimental group involving 34 students. From the results, the average value increased from 14.85 to 17.24, indicating an increase in learning outcomes after the experimental treatment. The standard deviation and variance decreased, which means the distribution of posttest scores is more homogeneous. Negative skewness indicates the data distribution is skewed to the right (more high scores). Kurtosis in the pretest was quite high (7.082), indicating a sharp peak in the distribution, while in the posttest it approached a normal distribution (0.300).

Data Analysis Techniques

Normality Test

The Shapiro-Wilk normality test is a statistical method used to determine whether data is normally distributed. The Shapiro-Wilk test compares the distribution of sample data to the expected normal distribution, producing a test statistic (W) and a significance level (p-value). If the p-value is greater than a certain significance level (e.g., 0.05), the data is considered normally distributed. If the p-value is less than 0.05, the data is considered non-normally distributed.

Table 3. Normality Test Results

Tests of Normality		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		cs	Df	Sig.	Statistics	Df	Sig.
Experimental Class	Pretest	.107	34	.200 *	.946	34	.486
	Posttest	.106	34	.200 *	.972	34	.096
Control Class	Pretest	.112	32	.200 *	.958	32	.226
	Posttest	.104	32	.200 *	.949	32	.102

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Based on the table above, it is known that the significance value (Sig.) for the experimental class in the pretest was 0.486 and in the posttest was 0.096. Meanwhile, the significance value for the control class in the pretest was 0.226 and in the posttest was 0.102. All significance values from the Shapiro-Wilk test in the experimental and control classes

were greater than 0.05. This indicates that the data in the pretest and posttest in both the experimental and control classes were normally distributed.

Thus, it can be concluded that the student learning outcome data in this study meets the assumption of normality. Therefore, the data can be further analyzed using simple regression statistical tests, regression coefficient significance tests, and learning outcome tests administered through N-Gain to test the research hypothesis regarding the effect of the POE learning model on student learning outcomes.

Homogeneity Test

Before conducting further statistical tests, it is important to evaluate the homogeneity of data variance, which indicates whether the variance between data groups is uniform. One commonly used method is the Levene's test. This test aims to determine whether the data has a homogeneous variance. If the Levene's Statistic value is not significantly greater than 0.05, it can be concluded that the variance between groups is homogeneous, thus meeting the assumptions for further analysis. The following is the output of the Levene's test to evaluate the homogeneity of variance of the learning outcomes of class X students in POE learning.

Table 4. Results of Homogeneity Test

Test of Homogeneity of Variance		Levene			
		Statistics	df1	df2	Sig.
Experimental Class	Based on Mean	1,019	1	64	.316
	Based on Median	1,010	1	64	.318
	Based on Median and with adjusted df	1,010	1	69,992	.318
	Based on trimmed mean	1,016	1	64	.317
Control Class	Based on Mean	1,015	1	64	.225
	Based on Median	1,010	1	64	.215
	Based on Median and with adjusted df	1,010	1	69,990	.215
	Based on trimmed mean	1,011	1	64	.213

Based on the homogeneity test results table, the significance value (Sig.) obtained in the Levene test based on the mean was 0.316 for the experimental class and 0.225 for the control class. These values are all greater than 0.05, both when viewed from calculations based on the mean, median, median with adjusted df, and trimmed mean. Because the significance value is greater than 0.05, it can be concluded that the data variance between the experimental and control classes is homogeneous. Thus, the assumption of homogeneity

has been met, which means that the variance between the groups studied is considered equal.

Hypothesis Testing

Simple Regression Test

Based on the results of the SPSS data analysis, the results of the Simple Linear Regression test are shown in the following table:

Table 5. Simple regression test

Model Summary				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.781 ^a	.610	.605	2,456

a. Predictors: (Constant), application of the Poe learning model

The results of the simple regression analysis show that the correlation coefficient (R) value is 0.781. This value indicates that there is a strong relationship between the variable of the application of the POE learning model and student learning outcomes. The R Square value of 0.610 means that 61% of the variation in student learning outcomes can be explained by the variable of the application of the POE learning model. The Adjusted R Square value of 0.605 corrects the R Square value to better suit the number of variables in the model and the sample size used, and still indicates that this model is quite good at explaining the dependent variable (learning outcomes). The Std. Error of the Estimate value of 2.456 indicates the magnitude of the standard error in estimating learning outcomes based on this regression model. Thus, it can be concluded that there is a strong and significant influence between the application of the POE learning model and improving student learning outcomes.

N-Gain Test

Based on the results of the SPSS data analysis, the results of the N-Gain test are shown in the following table:

Table 6. N-Gain Test of Experimental Class

Descriptive Statistics						
Experimental Class						
	Statistics	Std. Error	Bootstrap ^a			
			Std. Bias	Std. Error	95% Confidence Interval	
					Lower	Upper
NGain_score	N	34	0	0	34	34
	Range	0.65				
	Minimum	0.21				
	Maximum	0.86				

	Sum	16.25					
	Mean	0.478	0.021	-0.002	0.021	0.435	0.521
	Standard	0.121		-0.005	0.012		
	Deviatio						
	n						
	Variance	0.015					
	Skewness	0.218	0.403	-0.002	0.401	-0.580	0.871
	Kurtosis	-0.426	0.788	-0.004	0.788	-1,994	1,037
NGain_per	N	34		0	0	34	34
cent	Range	65.00					
	Minimum	21.00					
	Maximum	86.00					
	Sum	1625.00					
	Mean	47.80	2,100	-0.20	2,100	43.50	52.10
	Standard	12.10		-0.50	1.20		
	Deviatio						
	n						
	Variance	146.41					
	Skewness	0.218	0.403	-0.002	0.401	-0.580	0.871
	Kurtosis	-0.426	0.788	-0.004	0.788	-1,994	1,037
Valid	NN	34		0	0	34	34
(listwise)							

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Based on the results of the N-gain calculation obtained in the score above, the average N-gain value for the experimental class (POE learning model) seen from the mean is 0.478 or 21%, which is included in the ineffective category in improving student learning outcomes, as well as the control class which uses the lecture method, which is 0.208 in the ineffective (low) category.

Discussion

Based on the comparison of pretest and posttest in the experimental class using the POE model (Predict, Observe, Explain) this is supported by the results of statistical tests, obtained with the results of the t-value of $8.162 > 2.034$ and the regression test with the significance of the application of the POE learning model is known to have a Sig. value of 0.001, < 0.05 , then the results of the N-Gain test in the experimental class show that the average mean value is 0.478, while in the control class it is only 0.208. These results indicate that there is a significant difference between learning outcomes before and after the implementation of the POE learning model. The increase in student learning outcomes in

the experimental class shows the success of the average learning outcomes in the experimental class has increased by 16.1%, this proves that the POE learning model is effective in improving student learning outcomes compared to the control class using the conventional learning model (Khafid, 2022) .

The results of this study are in line with Zainatu's research (Arista, 2021) which showed that there was an influence of the POE (prediction, observation, explanation) learning model on student learning outcomes (Sari & Lestari, 2018) . However, there are several fundamental differences that make this study unique compared to those studies (Giofanny, Sriartha, & Tungga Atmadja, 2020) . First, in terms of the subjects studied, this study focused on economics, while Zainatu and Hasmiyanti Sapiuddin's research applied the POE model to science subjects. Then, in terms of the data analysis approach, this study not only used different tests such as the t-test, but also used simple linear regression analysis to determine the extent of the influence of the POE model on learning outcomes (Doni, 2022) . The results showed that the POE model contributed 61% to improving student learning outcomes, a quantitative data not found in previous studies (Riadin & Jailani, 2021) . Furthermore, in terms of school context and population, this study was conducted at Imelda Private High School, Medan, with the characteristics of urban private school students. Unlike previous research, which was mostly conducted in public schools and junior high schools, this study proves that the POE model is also effective when applied at the high school level and in the context of private schools (Imron, 2016).

In addition, the advantages of implementing the POE (prediction, observation, explanation) learning model are to train activeness and stimulate critical thinking in participating in classroom learning, as well as encourage involvement through the process of prediction, observation, and final explanation so as to improve students' ability to express opinions or provide responses, active and enjoyable learning conditions, strengthen students' understanding and knowledge regarding the material presented and help teachers improve student learning outcomes (Hayati, 2022).

Thus, it can be concluded that the POE (prediction, observation, and explanation) learning model has been proven to have a positive impact on improving student learning outcomes and can be used as an alternative learning model to improve the quality of the teaching and learning process in schools.

CONCLUSION

Based on the results of research that has been conducted regarding the influence of the POE (Prediction, Observation, Explanation) learning model on the learning outcomes of Economics of class X students at Imelda Private High School, Medan, in the 2024/2025 Academic Year, the following conclusions can be drawn:

1. The POE (Prediction, Observation, Explanation) learning model has a positive impact on student learning outcomes. This can be seen in the average pretest score of 14.85 for students in the experimental class, followed by an increase in the average posttest score to 17.24. This represents a 2.39-point increase in learning outcomes

(approximately 16.1%). This increase is significantly greater than the increase in the control class, which only increased from 13.80 to 15.09, or 1.29 points (approximately 9.35%).

2. From the results of t count 8.162 and significance value (Sig.) $0.001 < 0.05$, this shows that there is a significant difference between learning outcomes before and after the application of the POE model, thus the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted.
3. The N-Gain calculation shows that the increase in student learning outcomes in the experimental class is in the medium category (0.464), while in the control class it is in the low category (0.208). This shows that the use of the POE model is more effective in improving learning outcomes than conventional learning models

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