

Examining the determine of self efficacy, social conditions, and scientific literacy based on PISA Testlike: An in-vitro study

D S Pratama^{1,3,*}, T I Hartini² and A Kusdiwelirawan¹

¹Program Studi Pendidikan Fisika, Universitas Muhammadiyah Prof. Dr. Hamka, Jl. Tanah Merdeka, Kp. Rambutan, Ciracas, Jakarta Timur, Indonesia

²Departemen Pendidikan IPA, Sekolah Pascasarjana, Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229, Bandung 40154, Indonesia

³SMK Avicena Rajeg, Jl. Rajeg-Mauk KM.01, Rajeg, Kab. Tangerang, Banten, Indonesia

*diansandipratama@gmail.com

Abstract. This study is aimed to determine the students achievement of scientific literacy with social condition as an independent variable and self efficacy as an intervening variable according as an *in-vitro* study. This research consist to used quantitative descriptive method and this study is applied on 56 students who are educated at the first grade of SMK Avicena Rajeg in academic years of 2017/2018. The instrument used was a scientific literacy test based on PISA test-like and social condition and self efficacy was a questionnaire. The result of this study showed that the residual regression analysis value of social condition and self efficacy was 0.941, the residual regression analysis value of social condition and self efficacy to scientific literacy was 0.932. The direct influence of exogenous variables in the form of social conditions on endogenous variables is 11.61%, and the effect of self efficacy as an intervening variable is 9.24%. This value was considered means social conditions have a positive effect directly or through the self efficacy of students at the first grade of SMK Avicena Rajeg.

1. Introduction

Many People say the twentieth century is the digital era, the era of progress of Science and Technology (IPTEK) that almost in all aspects of human life we can find a lot of utilization. These advances in fact have an impact on the development of education in Indonesia. The Government through the Ministry of Education and Culture (KEMDIKBUD) is also always making improvements to improve and evaluate the quality of education in Indonesia, one of them by changing and or revising the curriculum within each educational unit. The history of Curriculum Development in Indonesia has two periods [1].

One of the benchmarks of whether or not the quality of a country's education can be seen from an international study of literacy, reading, mathematics and science achievement was globally recognized and coordinated by the Organization for Economic Cooperation and Development (OECD) called PISA.

When we talking about education, it would be better to see it not just from a single point of view. We must also understand the psychological and non-psychological conditions that occur in the students so as to know the factors that become problems in learning both internal and external. The internal problems of students in learning from psychological factors, namely intelligence, motivation, interest, talent, confidence, and stress conditions[2]. Reinforcing what has been explained, Ekohariadi provides

the results of regression analysis that can reveal whether self efficacy and motivation predict the science literacy of female and male students [3].

As Melek shows, Since the prospective teachers mainly take major area courses (physics, chemistry, biology, mathematics, Turkish, geography), they do not have enough knowledge of scientific literacy. However, they take science education courses in higher grades. So knowing about scientific literacy may have contributed to their self-efficacy beliefs [4].

1.1. Programme for International Student Assessment (PISA)

The Programme for International Student Assessment (PISA) is an international study of literacy achievement in reading, math, and science of 15 years old school students. The study was coordinated by the OECD (Organization for Economic Cooperation and Development) located in Paris, France [5].

The aimed of PISA actually to measure achievements of literacy reading, math, and science in 15 years old schoolchildren in participating countries. For Indonesia, the benefits that can be gained include to measure the ability of higher order thinking skills in accordance with the achievement of student competence in the implementation of Curriculum 2013 [6]. The average score of Indonesian science literacy based on the results of a successive PISA study from 2000 until 2015 can be seen in the following Table 1:

Table 1. Scientific Literacy's Ability of Indonesian School based on PISA Test

Periods	\bar{x} Indonesia	\bar{x} OECD	p	N
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2003	395	500	0.796	40
2006	393	500	0.782	57
2009	383	500		65
2012	382	501		65
2015	403	493		72

Based on table 1, it is illustrated that the achievement of Indonesian student science literacy in 2000 was ranked 38th. In 2003, for science literacy was still ranked 38 out of 41 countries. In 2006, science literacy ranked 50th out of 57 countries. The PISA 2009 results show internationally, Indonesia is still below the OECD average. In 2012, there was no significant increase in science literacy achievement, while in PISA 2015, there was a significant increase in Indonesia's international ranking.

1.2. Self Efficacy

Bandura explains that self efficacy is a person's beliefs about his or her ability and capacity to accomplish certain tasks or current behaviors with future success. The belief determines the behavior/performance, the amount of effort performed and the length of the behavior maintained if obstacles are encountered [7]. Self efficacy has three microanalysis procedures or it can be said as the main aspect in self efficacy that is:

- a. Level/Magnitude: Relates to the difficulty level of the task performed. Individuals tend to avoid situations beyond their limits.
- b. Generality: Related to the area faced.
- c. Strength: Relates to the strength of a person's beliefs about his/her abilities.

1.3. Social Condition of Rajeg Sub-Districts and SMK Avicena Rajeg

Rajeg Sub-district has a total population of 171,597 people with male gender ratio of 87,610 and women of 83,987. With the total area and the average population per District is 53.66 and 2.837 inhabitants. There are 1 state Senior High School, 7 Private High Schools, and 13 Private Vocational High Schools in Rajeg subdistrict, one of them is SMK Avicena Rajeg located at Rajeg-Mauk Street Km.01 Rajeg District, Tangerang Regency, Banten and become sample in this research.

From the initial observations made it turns out the average parent of middle and low economic status who mostly work as farmers, traders, or working odd jobs. In addition, many of them have more than two children, so that their parents' income can not meet the needs of their children, especially for educational purposes.

2. Experimental Method

2.1. Sample and Populations

The population in this study are all students of first grade competence of OTKP at SMK Avicena Rajeg consisting of class X OTKP-1 amounted to 30 students and class X OTKP+ which amounted to 26 students, the total population of research is 56 students. This research is a study with population approach, so the sample is the population itself.

2.2. Variables

This variables consist about three kinds, it has independent variable, intervening variable and dependent variable.

2.3. Statistic Tests

There are three kinds of statistic tests, it has:

- Normality Test, aims to test whether in the regression model, independent variables and dependent variables have a normal distribution or not.
- Multikolonierty test, can be used to determine whether there is correlation between independent variables (independent) in the regression model in a study.
- Heteroskedastisity Test, to test whether in the regression model the variance of variance of the residuals of an observation to another observation can be tested for heteroscedasticity.

2.4. Path Analysis

In this model of analysis, we use the strong direct influence between independent variables (exogenous) and endogenous variables with p symbols and residual variables that represent other variables beyond the use of the symbol ϵ .

3. Result and Discussion

3.1. Normality Test

The Normality test can be calculated using the One Sample Kolmogorov-Smirnov test, if asymp. Significance > 0.05 then the data is normally distributed. Based on data of research result (see figure 2) obtained by asymp. significance (2-tailed) of 0.677 > 0.05 which means the data is normally distributed. the full results can be seen in table 2 below:

Table 2. Normality test using One Sample Kolmogorov-Smirnov

Periods	\bar{x} Indonesia	\bar{x} OECD	p	N
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Table 3. Coefficient Collinearity Statistic

Model	Unstandarized Coefficient		t	Sig.	Collinearity Statistics	
	B	Std. Error			Tolerance	VIF
(Constant)	38.070	7.291	5.222	0.000		
Self Efficacy	0.238	0.107	2.231	0.030	0.886	1.128
Social Conditions	0.090	0.105	0.857	0.395	0.886	1.128

Seen in table 3 VIF values for each variable below 10, i.e. 1.128 and tolerance value > 0.1 so it can be concluded not found the existence of multicollinearity.

3.3. Heteroskedastisity Test

Heteroscedasticity can be seen from the value of the Glejser test to regress the residual absolute value of the independent variable. For more details please note table 4 below

Table 4. Heteroskedastisity using Glejser Test

Model	Unstandarized Coefficient		T	Sig.	Collinearity Statistics	
	B	Std. Error			Tolerance	VIF
(Constant)	6.791	4.069	1.669	0.101		
Self Efficacy	-0.043	0.060	-0.715	0.478	0.886	1.128
Social Conditions	-0.016	0.059	-0.274	0.785	0.886	1.128

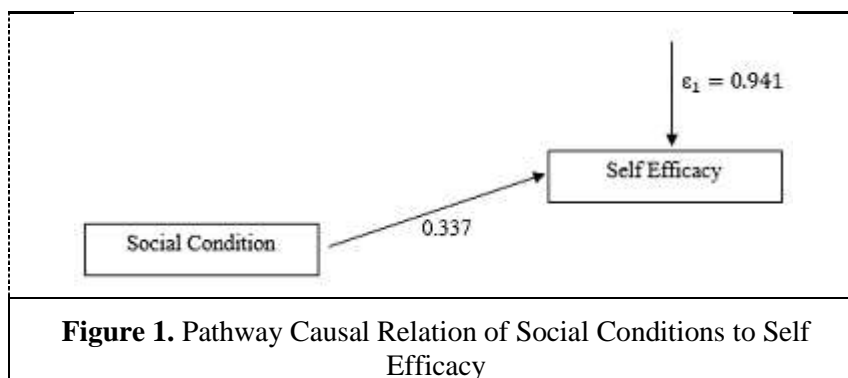
Table 4 shows the value of heteroscedastisity test using glejser test with the help of SPSS shows that none of the statistically significant independent variables affects the dependent variable. Seeing the significance value of 0.785 for social conditions and 0.478 for the self efficacy variable is at the 5% confidence level can be concluded that there is no heteroskedastisity to independent variables.

3.4. The Effect of Social Conditions on Self Efficacy

Table 5. Coefficient of determination of Social Condition to Self Efficacy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.337	0.114	0.097	5.26838

Based on the above table, obtained coefficient p1 for social condition variable of 0.337. From the analysis obtained coefficient of determination of 0.114. The coefficient of determination is then used to calculate the residual value of the regression analysis to obtain the residual value of 0.941. From the above calculations, the causal relationship model of exogenous variables to endogenous can be described as follows:

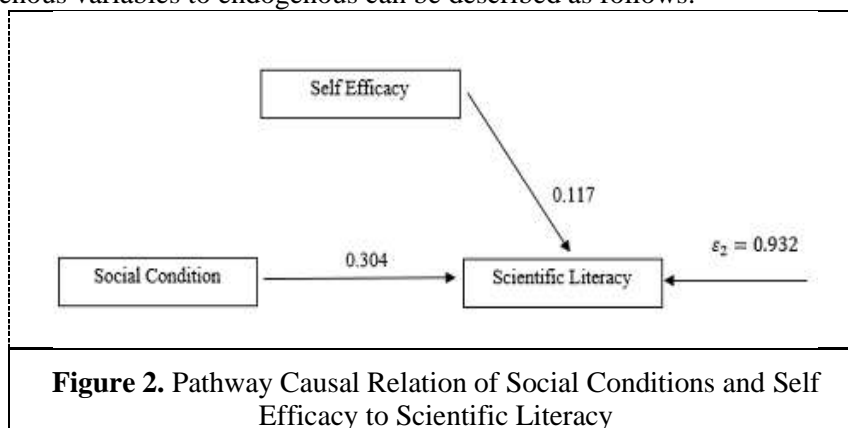


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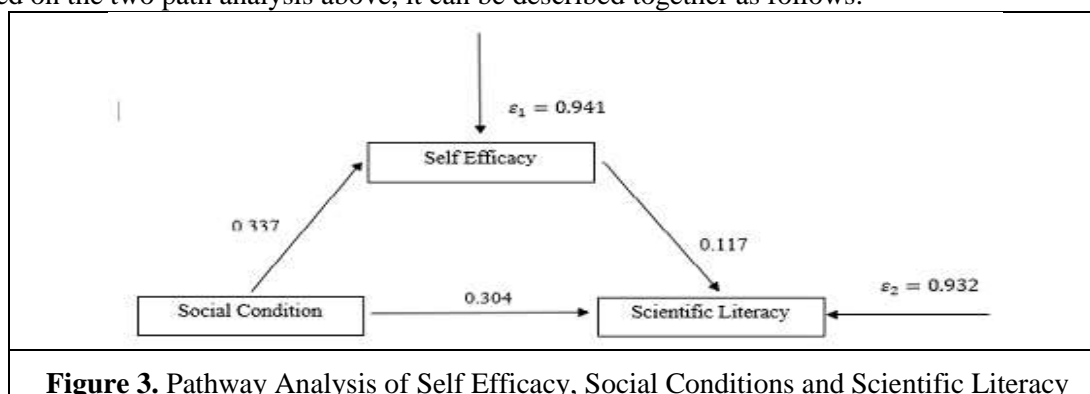
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Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Standard Coeff. Beta
1	0.360	0.130	0.097	4.13607	
Self Efficacy					0.304
Social conditions					0.117

Based on the above table, obtained coefficient βy_1 for social condition variable (X_1) of 0.304, for self efficacy variable (X_2) coefficient βy_2 of 0.117. From the above calculations, the causal relationship model of exogenous variables to endogenous can be described as follows:



Based on the two path analysis above, it can be described together as follows:



4. Coclusion

Based on the research and discussion that has been submitted above, it can be taken some conclusions, such as social conditions have a positive effect directly or through self efficacy against science literacy students class X OTKP at SMK Avicena Rajeg, the direct influence of exogenous variables in the form of social conditions on endogenous variables is 11.61%, and the effect of self efficacy as an intervening variable is 9.24%. This value was considered means social conditions have a positive effect directly or through the self efficacy of students at the first grade of SMK Avicena Rajeg.

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6.References

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Table 5. Coefficient of determination of Social Condition to Self Efficacy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
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Based on the above table, obtained coefficient p1 for social condition variable of 0.337. From the analysis obtained coefficient of determination of 0.114. The coefficient of determination is then used to calculate the residual value of the regression analysis to obtain the residual value of 0.941. From the above calculations, the causal relationship model of exogenous variables to endogenous can be described as follows:

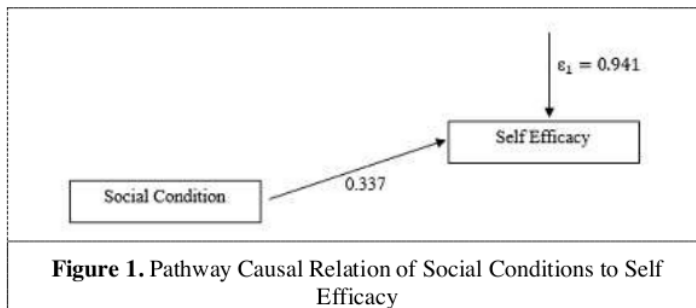


Figure 1. Pathway Causal Relation of Social Conditions to Self Efficacy

3.5. The Effect of Social Conditions and Self Efficacy to Scientific Literacy

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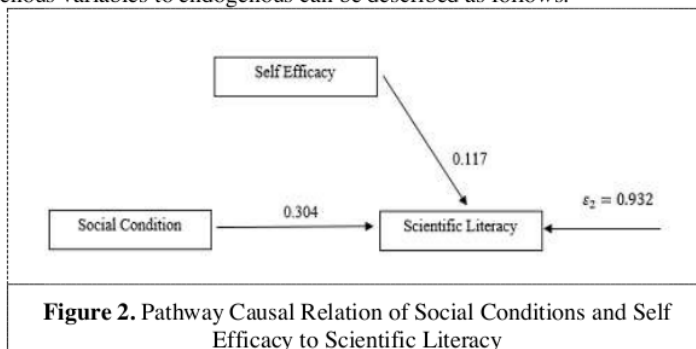


Figure 2. Pathway Causal Relation of Social Conditions and Self Efficacy to Scientific Literacy

Based on the two path analysis above, it can be described together as follows:

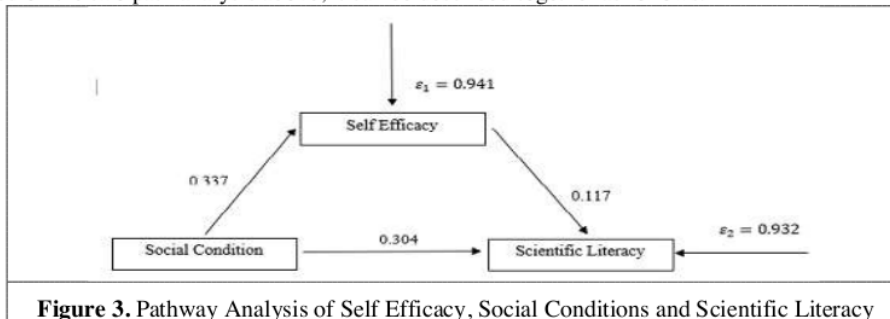


Figure 3. Pathway Analysis of Self Efficacy, Social Conditions and Scientific Literacy

4. Conclusion

Based on the research and discussion that has been submitted above, it can be taken some conclusions, such as social conditions have a positive effect directly or through self efficacy against science literacy students class X OTKP at SMK Avicena Rajeg, the direct influence of exogenous variables in the form of social conditions on endogenous variables is 11.61%, and the effect of self efficacy as an intervening variable is 9.24%. This value was considered means social conditions have a positive effect directly or through the self efficacy of students at the first grade of SMK Avicena Rajeg.

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