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The Analysis of Learning Infrastructure (LI), Learning Motivation (LM) and Economics Learning Achievement (ELA)

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ABSTRACT

This research aimed to find out whether or not there is an effect of Learning Infrastructure (LI) and Learning Motivation (LM) on Economics Learning Achievement (ELA), and which one has more dominant effect on Learning Achievement, Learning Infrastructure or Learning Motivation. This study was a descriptive quantitative research with survey method. The data of LI, LM and ELA were collected using questionnaire. The population of research consisted of 1192 economics students in Public Senior High Schools of Serdang Bedagai Regency applying the 2013 curriculum. The sample consisted of 300 respondents, taken using cluster areas sampling technique. From the result of research, it can be found that there was a positive significant effect of LI on ELA ($t_{statistic}$=9.597, P = 0.000), there was a positive significant effect of LM on ELA ($t_{statistic}$=6.990, P=0.000), there was a positive and significant effect of LI and LM on ELA ($F_{statistic}$=114.281, P=0.000), and LI affected ELA more dominantly than LM did.

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1. INTRODUCTION

Improving education quality is very important thing. Education is a very appropriate way of dealing with challenge and changing community [1]. In fact, the students experience the violence and laziness tendency impacting negatively on the learning achievement. The problem needs to be anticipated in order to prevent the decrease of learning achievement from occurring. One of learning achievements needs to be improved is economics learning achievement. It is considered as important to create economic knowledge, economic skill, and economic behavior that can be utilized in living within society. One way of improving learning achievement is to pay attention to the students' motivation [2-3]. The further way to improve the learning achievement is to pay attention to learning facility [4].

Good environment will also affect the learning [5]. Otherwise, negative environment will inhibit the students' performance [6-8]. Infrastructure is required to support the successful objective of education institution. Infrastructure includes the following criteria: classroom, sport area, library, worship place, laboratory, playground and learning source supporting the learning process [9]. Good infrastructure will support the effective and efficient implementation of learning process. School should consider minimum criteria of infrastructure with minimum criteria of classroom, sport area, worship place, library, laboratory, workshop, playground, expressing and creative area, and learning source needed to support the learning process.

Motivation is very important to human behavior. Motivation is basic impulse driving an individual to behave. Then, achievement motivation has been conceptualized traditionally as a disposition motivating an individual to deal with challenge to achieve success and superiority [10]. Motivation plays an important part in learning, to both teachers and students. To teachers, recognizing the students' learning motivation is very desirable in order to maintain and to improve the students' learning spirit. To students, learning motivation can grow the learning spirit so that the students are encouraged to do learning activity. The students with achievement motivation will have higher achievement than those without achievement motivation. Motive cannot be observed directly but it can be interpreted in behavior, in the form of stimulation, impulse, or power generator of a certain behavior emergence [11]. Motivation is a power, either internal or external, encouraging an individual to achieve the specified objective [12]. Achievement motivation is an attitude to attain achievement within themselves [13]. Achievement motivation is a desire to do the best in some superior standards [14].

The future need is one of psychological motivation playing an important role in the students' success and achievement. Motivation is an academic set referring to cognitive and emotional aspects, and students' investment behavior in education [15]. Achievement motivation has been defined as a reference for different needs in each individual to achieve reward such as physical gratification, others' praise, and self gratification [16].

The students with high achievement motivation will act to surpass others, to meet or to surmount other superiority standard or to do something uniquely. All students affected by the need for obtaining something will work hard to achieve the success. Achievement motivation usually refers to motivation level involved in the parameter of interaction corresponding to achievement need, success expectation and success incentive [17].

Those having sincere achievement motivation will have the following characteristics: (1) loving more and solving problems independently. Although they can work with others, they develop the assignment themselves. They prefer situations where they are considered as the only one responsible for solving the problem; (2) those having sincere motivation tend to go toward the situation, where they get feedback immediately on their work product; (3) successful people are those determining the objective containing risk, thereby can expand the opportunity of getting a satisfactory work product [11].

Economics learning achievement is inseparable from economic learning action, because economic learning is a learning process in economics subject. The achievement of learning achievement proves the students' successful learning or the individual's ability of implementing learning activity according to the quality attained [18]. Learning achievement is the perfection an individual achieves in thinking, feeling and acting; learning achievement can be said as perfect when fulfilling three aspects: cognitive, affective, and psychomotor; and otherwise, it is considered as less satisfactory when an individual has not been able yet to meet the target in the three criteria [19]. Cognitive learning into knowledge, comprehension, application, analysis, synthesis and evaluation, affective object into five levels of achievement are receiving, responding, valuing, organization and characterization, psychomotor objectives are reflex movements, fundamental movements, perceptual abilities, physical abilities, skilled movements and non-discursive communication [20].

2. RESEARCH METHOD

This study employed survey method aiming to find out the correlation between two exogenous variables (Learning Infrastructure or LI and Achievement Motivation or LM) and one endogenous variable (Economics Learning Achievement or ELA). The population of research consisted of 1192 economic students in Public Senior High Schools in Serdang Bedagai Regency using the 2013 curriculum. The sample was taken using Slovin formula=N/(Ne2+1)=1192/(1192x0.052+1)=299.5=300 respondents. The sampling technique used was Cluster Sampling one.

Data of LI, LM and ELA variables were collected using close-ended questionnaire. The measurement scale used was 1-7 likert scale. Data analysis was carried out with SPSS 22 help. This method was selected corresponding to the objective of research, to find out the effect of LI on ELA, the effect of LM on ELA, and the effect of LI and LM on ELA, and to find out which one has more dominant effect on ELA, LI or LM. The research design can be illustrated in Figure 1.

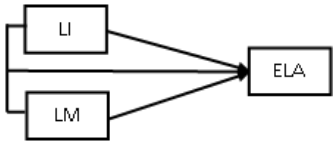

Figure 1. Conceptual Framework

The hypotheses proposed in this research are as follows:
a. There is a positive significant effect of LI on ELA.
b. There is a positive significant effect of LM on ELA.
c. There is a positive significant effect of LI and LM on ELA.
d. Which variable has more dominant effect on ELA, LI or LM

3. RESULTS AND ANALYSIS

3.1. Validity and Reliability Test

3.1.1. Result of Validity Test

Instrument validity test is carried out by considering the correlational score between statement items in individual research variables. If rstatistic>rtable and the score is positive, the research instrument is stated as valid. The result of validity test can be seen from table 1.

Table 1. Validity Test

Variable	Questionnaire Item	$r_{statistic}$	r_{table}
LI	X1.1	.815	.361
	X1.2	.931	.361
	X1.3	.918	.361
	X1.4	.826	.361
	X1.5	.912	.361
LM	X2.1	.921	.361
	X2.2	.839	.361
	X2.3	.894	.361
	X2.4	.908	.361
	X2.5	.824	.361
	X2.6	.933	.361
ELA	Y1.1	.865	.361
	Y1.2	.839	.361
	Y1.3	.887	.361

**Correlation is significant at the 0.01 level (2-tailed)

Table 1 shows rstatistic value compared with rtable. All questionnaire items have correlational value (rstatistic) higher than rtable value. Considering the criteria of validity test, all research instrument items are valid. The research instrument can be used to obtain the data of research.

3.1.2. Result of Reliability Test

The result of reliability test is conducted using statistic test Cronbach Alpha. The criterion used to state that research instrument is valid is that Cronbach Alpha value >0.70. The result of reliability test can be seen in Table 2.

Table 2. Reliability Test

Variable	Cronbach Alpha
LI	0.928
LM	0.945
ELA	0.817

Table 2 shows that all research variables have Cronbach Alpha value >0.70. It means that all questions in each variable are reliable.

3.2. Classical Assumption Test

3.2.1. Normality Test

Normality test is carried out to find out whether or not the data collected is distributed normally. In this research, normality is tested using non-parametric Kolmogorov-Smirnov (K-S) statistic test. In residual it is distributed residual normally when probability >0.05 (5%). Data is stated as distributed normally when its significance value is higher than 0.05. The result of normality test can be seen in table 3.

Table 3. Normalitas Test

One-Sample Kolmogorov-Smirnov Test		
		Standardized Residual
N		300
Normal Parameters[a]	Mean	.0000000
	Std. Deviation	.99664991
Most Extreme Differences	Absolute	.029
	Positive	.020
	Negative	-.029
Kolmogorov-Smirnov Z		.505
Asymp. Sig. (2-tailed)		.961

a. Test distribution is Normal.

From table 3, it can be seen that Kolmogorov-Smirnov K is 0.505 with significance level a=0.05. Z_{table} in standard normal distribution is 1.96. Because 0.505<1.96 or $Z_{statistic}$ (Kolmogorov-Smirnov) <Z_{table}, and asymp. Sig value 0.961>0.05, it can be concluded that the data follow normal distribution.

3.2.2. Autocorrelation Test

Autocorrelation test is a statistic analysis conducted to find out whether or not there is a correlation between confounding error in t period and error in t-1 period (previous year). To test autocorrelation, Durbin Watson (DW) value can be seen with the following hypotheses.

1. If DW statistic <DL (Durbin Lower), or DW statistic >4-DL, Ho is not supported meaning that there is autocorrelation.
2. If Durbin Upper (DU)<DW <4-DU, Ho is supported, meaning that there is no autocorrelation.
3. If DL≤DW≤DU or 4-DU≤DW≤4-DL, it is considered as inconclusive.

Table 4. Durbin Watson-Test (DW test)

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.659[a]	.435	.431	3.420	2.031

a. Predictors: (Constant), LI, LM
b. Dependent Variable: ELA

Considering the result of calculation as shown in table 4, it can be found that DW value is DU<DW<4-DU (1.803<2.031<2.197). Therefore, it can be concluded that the data of observation does not encounter autocorrelation problem.

3.2.3. Multicollinearity Test

Multicollinearity test is conducted by analyzing matrix of correlation between independent variable, tolerance value, and variance inflation factor (VIF) values. Inter-variable criterion experiencing multicollinearity is correlation value >0.95. If Tolerance <0.10 value and VIF value >10, so that multicollinearity occurs. The result of multicollinearity can be seen in Table 5.

Table 5. Multicollinearity Test

Variable	Questionnaire Item	*Correlation*	*Collinearity Statistics*	
			Tolerance	*VIF*
LI	X1.1	0.815	0.847	1.181
	X1.2	0.931		
	X1.3	0.918		
	X1.4	0.826		
	X1.5	0.912		
LM	X2.1	0.921	0.847	1.181
	X2.2	0.839		
	X2.3	0.894		
	X2.4	0.908		
	X2.5	0.824		
	X2.6	0.933		

From the result of calculation, it can be found that all correlations have score of < 0.95. The result of calculation shows tolerance value >0.10 and VIF value <10; thus, it can be concluded that there is no multicollinearity occurring between independent variables in research model.

3.3. Simple Linear (partial) Analysis

Simple linear analysis is used to find out causal relationships between LI and ELA and between LM and ELA variables. To find out the coefficient of correlation, SPSS 22 software is used. The result of data processing can be seen in table 6.

Table 6. Simple Linear Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.201	.997		-.202	.840
	LI	.354	.037	.455	9.597	.000
	LM	.218	.031	.331	6.990	.000

a. Dependent Variable: ELA

The result of data processing shows that there is an effect of LI on ELA, as indicated with $t_{statistic}>t_{table}$ or 9.597>1.96. There is an effect of LM on ELA, as indicated with $t_{statistic}>t_{table}$ or 6.990>1.96

3.4. Multiple Linear (simultaneous) Analysis

A multiple linear analysis is used to find out the simultaneous relationship of LI and LM to ELA. To estimate the parameter or the coefficient of regression, SPSS 22 software package is used. The result of data processing can be seen in table 7.

Table 7. Multiple Linear Analysis

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2673.058	2	1336.529	114.281	.000[a]
	Residual	3473.462	297	11.695		
	Total	6146.520	299			

a. Predictors: (Constant), LI, LM

b. Dependent Variable: ELA

The result of analysis on the effect of LI (X_1) and LM (X_2) variables on ELA (X_3) shows $F_{statistic}>F_{table}$ or 114.281>3.04. The dependent variable in regression analysis is ELA, while independent one is LI and LM. Regression model based on the result analysis is Y=-0.201+0.354X1+0.218X2.

The interpretation of equation above is:

1. b_o=-0.201
   Constant value shows that if there are no LI and LM variables (X_1+X_2=0), the score of ELA is -0.201 or negative.
2. b_1=0.354
   Coefficient of regression b_1 shows that every 1 point increase in LI results in an increase by 0.354 point in ELA, with the assumption that the score of LM variable is constant.
3. b_2=0.218
   Coefficient of regression b_2 shows that every 1 point increase in LM results in an increase by 0.218 point in ELA, with the assumption that the score of LI variable is constant.

3.5. Hypothesis Testing

3.5.1. First Hypothesis

To test the first hypothesis, t-test is used. There is an effect of learning infrastructure on economics learning achievement, as indicated with $t_{statistic}>t_{table}$ or 9.597>1.96 at significance level of 0.000<0.05. Considering the result of research, it can be concluded that H_o is not supported and H_1 is supported.

3.5.2. Second Hypothesis

To test the second hypothesis, t-test is used. There is an effect of learning motivation on economics learning achievement, as indicated with $t_{statistic}>t_{table}$ or 96.990>1.96 at significance level of 0.000<0.05. Considering the result of research, it can be concluded that H_o is not supported and H_1 is supported

3.5.3. Third Hypothesises

To test the third hypothesis, F-test is used. There is an effect of learning infrastructure and learning motivation on economics learning achievement, as indicated with $F_{statistic}>F_{table}$ or 114.281>3.04 at significance level of 0.000<0.05. Considering the result of research, it can be concluded that H_o is not supported and H_1 is supported. The size of the effect of learning infrastructure and learning motivation on economics learning achievement simultaneously can be seen from coefficient of determinacy (R^2). R^2 (R square) value is 0.435, indicating that the size of the simultaneous effect of learning infrastructure and learning motivation on the economic learning achievement is 43.5%, while the rest of 56.5% is affected by other variables excluded from the research model. Meanwhile, R value is 0.659, interpreted that the coefficient of correlation of learning infrastructure and learning motivation variables on learning achievement is strong.

3.5.4. Fourth Hypothesis

To test the fourth hypothesis, analysis on dominant effect of contribution or dominant effect on dependent variable in a linear regression model, unstandardized coefficient (β) should be found first. Table 6 shows that β value of learning infrastructure on economics learning achievement is 0.354, and β value of learning motivation on economics learning achievement is 0.218. Therefore, it can be concluded that learning infrastructure affects economics learning achievement more dominantly than learning motivation variable. Thus, the fourth hypothesis stating that learning infrastructure affects economics learning achievement more dominantly than learning motivation does is supported.

3.6. Discussion

Considering the result of data analysis on research hypothesis testing, it can be found that there is a positive and significant effect of learning infrastructure and achievement motivation variables on economic learning achievement. Such the effect is indicated both partially and simultaneously.

From data analysis, it can be found that infrastructure affects economic learning achievement positively and significantly with tstatistic of 9.597 at significance level of 0.000. Some studies have also found that there is a positive significant effect of quality of school facilities on student achievement [21-24]. Then, another finding explained that there is a positive and significant effect of infrastructure facilities on students' academic achievement, as indicated with chi square 177.1 at significance level of 0.05 [25].

The next finding shows that achievement motivation affects economics learning achievement positively and negatively with tstatistic of 6.990 at significance level of 0.000. Some previous studies also found that there is a positive and significant effect of motivation on learning achievement [14], [26-31].

Then, another finding of research shows that learning infrastructure and learning motivation affects positively the economics learning achievement simultaneously by 114.281 at significance level of 0.000. Then, based on beta unstandardized coefficient score, it can be concluded that infrastructure affects partially the economics learning achievement more dominantly than learning motivation does.

Considering the research finding, it can be said that learning infrastructure should be considered either quantitatively or qualitatively. The importance of learning infrastructure in supporting the successful learning and in improving economics learning achievement should be prioritized by government. Achievement motivation should be created through students' demand for self achievement. Therefore, learning infrastructure and learning motivation should be improved in order to improve the economics learning achievement as expected

4. CONCLUSION

Learning infrastructure affects economics learning achievement positively and significantly ($t_{statistic}$=9.597, p=0.000). Learning motivation variable affects significantly the economics learning achievement ($t_{statistic}$=6.990, p=0.000). Then, learning infrastructure and achievement motivation variables affect economics learning achievement positively and significantly ($F_{statistic}$=114.281, p=0.000). Learning infrastructure variable affects economics learning achievement more dominantly (β=0.354) than learning motivation variable does (β=0.218) in the students of Public Senior High Schools in Serdang Bedagai Regency.

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