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The Influence Of Infrastructure, Learning Methods On Student Achievement Through Student Learning Motivation During The COVID-19 Pancemic at SMK Negeri 9 Jakarta

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Abstract: Through examining student learning motivation, this study seeks to determine the impact of online learning infrastructure and techniques on student learning achievement. The population of this study is students at SMK Negeri 9 Jakarta, with a sample size of 150 students. The data analysis method used Structural Equation Model-Partial Least Square (SEM-PLS). The findings of this study show that student achievement is not directly affected. The strategy of online learning facilities and infrastructure significantly influences students' enthusiasm for learning. Students learning achievement is directly affected by their enthusiasm to learn. Although the online learning infrastructure is not like the offline learning approach, it indirectly impacts student achievement through students' motivation to learn. The implications of this research are discussed in the article.

Keywords: Infrastructure Facilities, Online Learning Methods. Student Learning Motivation, Student Achievement

INTRODUCTION

The Covid-19 virus, or what we generally refer as the Coronavirus, has started to spread since the beginning of 2020. All countries, including Indonesia, are experiencing the effects of this lethal Coronavirus. The adverse effects of this virus are felt in all aspects of the industry in Indonesia. One of them is in the field of education. Teaching and learning activities are usually carried out face-to-face at school, but due to this virus, the Indonesian government decided to hold online teaching and learning activities. SMK Negeri 9 Jakarta is one of the SMKs experiencing problems in this online learning. Many teachers complain because children's achievements are very lacking. The cause is from many factors, where a teacher develops lesson plans, conducts learning activities, and assesses learning outcomes according to student results. (Setyo et al., 2017).

The implementation of the learning process has been almost four semesters since the beginning of the pandemic in 2020 until now.

Table 1. Differences in learning mechanisms before and after COVID-19 at SMK Negeri 9 Jakarta

No	Teaching and Learning Activities	Before the Pandemic	After the Pandemic
1	Curriculum	The curriculum used is the 2013 curriculum	Covid emergency curriculum
2	Day of implementation of the teaching and learning process	5 days (Monday - Friday)	5 days (Monday - Friday)
3	Teaching and learning hours	1 lesson hour: 45 minutes	1 lesson hour: 30 minutes
4	School Assignment	Assignments are submitted using notebooks or printouts, and there are usually only 2 - 3 assignments a week.	They collected assignments via email, Whatsapp, and other applications. Almost every day and every subject have assignments.
5	UTS, PAT and PAS	It is implemented in schools through the school system.	Conducted at home using Google Form, Quipper, Email and other applications.
6	LDKS and MPLS activities	Conducted in the school environment and outside the school area.	Conducted online using Zoom.
7	Extracurricular Activities	It was implemented at school according to the activity schedule.	Only a few extracurricular activities are held, and also online.
8	Student Absence	Manually every day in class.	Online using Google Forms and also Time Stamp.
9	Learning Methods	Face-to-face in class every day, and there is a smooth discussion during the learning process.	Online, face-to-face activities are sometimes conducted only once a week, considering the internet quota of each student and teacher. Discussions are limited due to signal and learning time.

Source: Data from SMK Negeri 9 Jakarta

Based on interviews and observations conducted at SMK Negeri 9 starting from April 2022, information on several obstacles faced by students and teachers during online learning that make learning achievements are as follows:

1. Constraints from Students
   - Limited internet quota to access the learning website and online activities daily.
   - Inadequate mobile phone capacity
   - The signal network of the provider used is not strong, so it hinders online learning
   - Students' lack of understanding in accepting online learning
   - Limited time due to limited quota and signal network
2. Constraints from Teacher
   - Difficulty getting feedback from the students being taught
   - Limited teaching time because during the pandemic, class hours are shortened
   - Too many applications that must be used by teachers
   - Teachers are not familiar with using these applications
   - Teachers find it difficult to know whether or not the student understands what the teacher is teaching
   - The school does not provide teaching facilities during online lessons

The author conducted further analysis by conducting a pre-survey which was researched at SMK Negeri 9 Jakarta. From the pre-survey results, some indicators must be further researched, namely the infrastructure factor at 86%, student learning motivation at 82%, and online learning methods at 84%. With these results, researchers need to conduct further research on the influence of these three factors on student achievement.

METHODS

This type of research uses quantitative methods by testing the extent to which the cause variable (X) affects the effect variable (Y). The constructs of this study are: Infrastructure Facilities refer to Absah's theory (2021), Learning Methods in Gustiani Sri (2020), Student Learning Motivation in Honesty (2020), and Student Learning Achievement in Hanesty (2021).
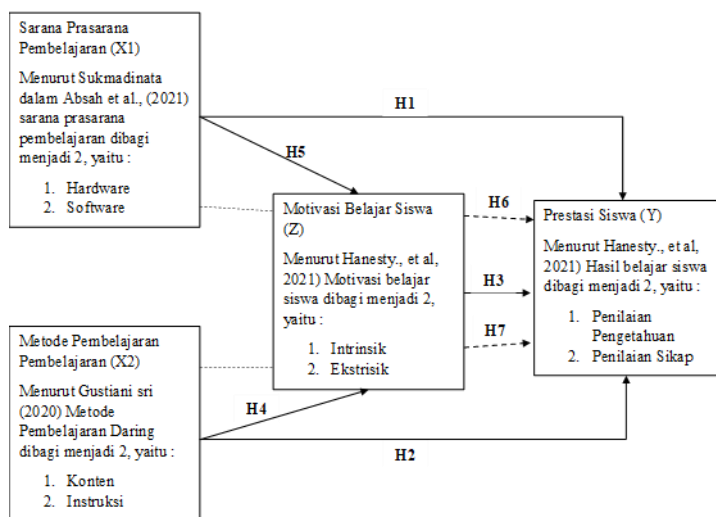

Figure 1. Framework of Thought

From the framework created by the author, the author concludes a hypothesis on each variable with the details below.

H1: Infrastructure facilities significantly influence student achievement in online learning at SMK Negeri 9 Jakarta.

H2: Online Learning Methods significantly influence student achievement in online learning at SMK Negeri 9 Jakarta.

H3: Student Learning Motivation significantly influences student achievement in online learning at SMK Negeri 9 Jakarta.

H4: Infrastructure facilities significantly influence student motivation in online learning at SMK Negeri 9 Jakarta.

H5: Online Learning Methods significantly influence student motivation in online learning at SMK Negeri 9 Jakarta.

H6: Infrastructure facilities significantly influence student achievement through the mediation of student motivation in online learning at SMK Negeri 9 Jakarta.

H7: Online Learning Methods significantly influence student achievement through the mediation of student motivation in online learning at SMK Negeri 9 Jakarta.

The population used by researchers as the object of research is students of SMK Negeri 9 Jakarta. SMK Negeri 9 Jakarta students total of 707 students from grade 10 to grade 12 from various majors. In this study, researchers used random sampling techniques.

Moreover, measure it using the Structural Equation Model (SEM). From the results of the SEM calculation, the maximum number that can be studied is a maximum of 240 respondents. The primary data of this study used a survey method by distributing questionnaires to students of SMK Negeri 9 Jakarta, as many as 150 students. The questionnaire data uses a Likert scale that uses five levels of answers. Researchers used the Structural Equation Model-Partial Least Square (SEM-PLS) for the data analysis method.

RESULTS AND DISCUSSION
1. Outer Model Analysis
a. Convergent Validity
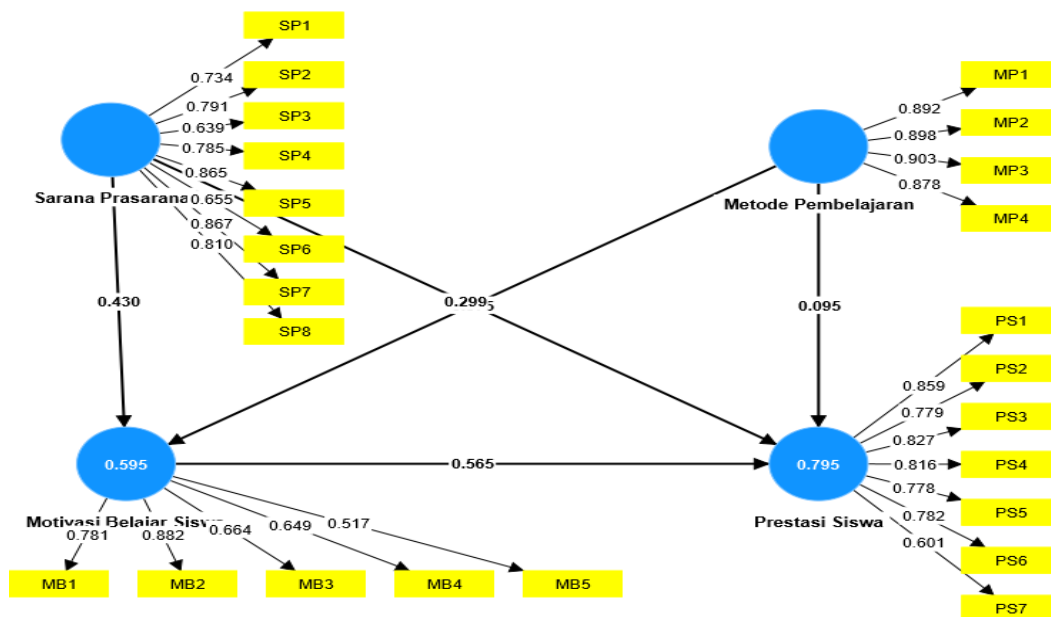
Source: Smart PLS Output (2022)
Figure 2. PLS algorithm results

Table 2. PLS algorithm results

Variabel	Item Code	Outer loadings	Terms	Description
Student Learning Motivation	MB1	0.781	0.50 – 0.60	Valid
	MB2	0.882	0.50 – 0.60	Valid
	MB3	0.664	0.50 – 0.60	Valid
	MB4	0.649	0.50 – 0.60	Valid
	MB5	0.517	0.50 – 0.60	Valid
Learning Methods	MP1	0.892	0.50 – 0.60	Valid
	MP2	0.898	0.50 – 0.60	Valid
	MP3	0.903	0.50 – 0.60	Valid
	MP4	0.878	0.50 – 0.60	Valid
Student Achievement	PS1	0.859	0.50 – 0.60	Valid
	PS2	0.779	0.50 – 0.60	Valid
	PS3	0.827	0.50 – 0.60	Valid
	PS4	0.816	0.50 – 0.60	Valid
	PS5	0.778	0.50 – 0.60	Valid
	PS6	0.782	0.50 – 0.60	Valid
	PS7	0.601	0.50 – 0.60	Valid
Infrastructure Facilities	SP1	0.734	0.50 – 0.60	Valid
	SP2	0.791	0.50 – 0.60	Valid
	SP3	0.639	0.50 – 0.60	Valid
	SP4	0.785	0.50 – 0.60	Valid
	SP5	0.865	0.50 – 0.60	Valid
	SP6	0.655	0.50 – 0.60	Valid
	SP7	0.867	0.50 – 0.60	Valid
	SP8	0.810	0.50 – 0.60	Valid

Source: Smart PLS Output (2022)

As shown in the table above, the results of stage 2 discriminatory validity testing show that all indicators have a constructed cross-loading more significant than the cross-loading value of other constructs so that they are declared valid. It can be concluded that learning infrastructure, learning methods, student learning motivation, and student achievement have good discriminant validity values.

b. Average Variance Extracted

Table 3. *Average Variance Extracted*

Variabel	AVE	Description
Learning Methods	0.797	Valid
Student Learning Motivation	0.503	Valid
Student Achievement	0.610	Valid
Infrastructure Facilities	0.597	Valid

Source: Smart PLS Output (2022)

Based on the table above, convergent validity construct testing results on all research variables, namely Learning Methods, Infrastructure Facilities, Student Learning Motivation, and Student Achievement, have met the criteria with an AVE value> 0.50.

c. Discriminant Validity

According to Ghozali (2015), other discriminant validity research uses reflective indicators, where the cross-loading value of each variable must be smaller than 0.70 so that the latent construct can predict the indicators in its block better than other blocks, as shown in the table below.

Table 4. Discriminant Validity (Cross Loading) Test Results

Code	Student Learning Motivation	Learning Methods	Student Achievement	Infrastructure Facilities
MB1	**0.781**	0.561	0.674	0.582
MB2	**0.882**	0.741	0.679	0.719
MB3	**0.664**	0.467	0.600	0.449
MB4	**0.649**	0.415	0.607	0.438
MB5	**0.517**	0.339	0.462	0.383
MP1	0.631	**0.892**	0.699	0.727
MP2	0.647	**0.898**	0.692	0.763
MP3	0.686	**0.903**	0.664	0.754
MP4	0.657	**0.878**	0.656	0.736
PS1	0.718	0.649	**0.859**	0.712
PS2	0.602	0.607	**0.779**	0.702
PS3	0.711	0.625	**0.827**	0.658
PS4	0.690	0.607	**0.816**	0.671
PS5	0.728	0.595	**0.778**	0.534
PS6	0.735	0.562	**0.782**	0.553
PS7	0.471	0.497	**0.601**	0.516
SP1	0.510	0.616	0.617	**0.734**
SP2	0.564	0.651	0.652	**0.791**
SP3	0.493	0.440	0.495	**0.639**

SP4	0.608	0.613	0.604	**0.785**
SP5	0.664	0.712	0.672	**0.865**
SP6	0.453	0.684	0.551	**0.655**
SP7	0.648	0.669	0.688	**0.867**

Source: Smart PLS Output (2022)

Based on the table above, the correlation value of the construct with its indicator is greater than the correlation value of other constructs. Then, it can be concluded that discriminant validity is good and considered reliable.

d. *Cronbach Alpha*

Table 5. Results of *Cronbach Alpha*

Variabel	Cronbach's alpha	Description
Learning Methods	0.940	Reliable
Student Learning Motivation	0.837	Reliable
Student Achievement	0.916	Reliable
Infrastructure Facilities	0.920	Reliable

Source: Smart PLS Output (2022)

Based on the table above, it can be seen that all variables in this research model are reliable because Cronbach's alpha is> 0.7 (Ghozali & Latan, 2015).

2. Inner Model Analysis
a. R-Square

Table 6. R-Square Test Results (R2)

	R-square	R-square adjusted
Motivasi Belajar Siswa	0.593	0.588
Prestasi Siswa	0.716	0.710

Source: Smart PLS Output (2022)

Based on the table, the R2 value of the student learning motivation variable is 0.593, which means that 59.3% of changes in student learning motivation are influenced by infrastructure and online learning methods. The remaining 40.7% may be affected for other reasons explained. Based on this, the results of the R2 calculation show that student learning motivation is classified as moderate in the R2 variable.

The R2 value of the student performance variable is 0.716, which means 71.6% of variations or changes in student performance are caused by infrastructure, e-learning methods, and student learning motivation. In comparison, the remaining 28.4% is caused by other factors.

Table.7 *Bootstrapping* Result

Relationship between constructs	Sample (O)	T statistics (|O/STDEV|)	P values
Infrastructure -> Student Achievement	0.299	1.595	0.111
Online Learning Method -> Student Achievement	0.095	0.555	0.579
Student Learning Motivation -> Student Achievement	0.565	4.730	0.000
Infrastructure -> Student Learning Motivation	0.430	2.225	0.026

Source: Smart PLS Output (2022)

Hypothesis 1 is rejected because the value of the t-statistic 1.595 is smaller than 1.96 and the P-value 0.111 is greater than 0.05. This causes the original sample to be negative, which is 0.299, which means that Hypothesis 1 is rejected because even though the infrastructure is maximized, it still does not improve student achievement. Then for hypothesis 2 it is rejected because the t-statistic value is 0.555 which is smaller than 1.96 and the P-Value value of 0.579 is greater than 0.05 so that the original sample value is negative, which is 0.095, which means that even though the online learning method is maximized, it still does not improve student achievement. Hypothesis 3 is accepted because the t-statistic value is 4.730 which is greater than 1.96 and the P-Value value of 0.000 is smaller than 0.05, so the original sample value is positive, namely 0.565, which means, student learning motivation has a significant effect on student achievement. For hypothesis 4, it is known that the t-statistic value is 2.041 which is greater than 1.96 and the P-Value value of 0.041 is smaller than 0.05, so the original sample value is positive, namely 0.375, which means, Infrastructure Facilities have a significant effect on student learning motivation. And for hypothesis 5, it has a t-statistic value of 2.225 which is greater than 1.96 and a P-Value of 0.026 which is smaller than 0.05, where the original sample value is positive, namely 0.430, so it can be concluded that online learning methods have a significant effect on student learning motivation.

The table below provides an analysis of the effect of mediating variables:

Table. 8 Hypothesis Testing of Indirect Influence

Relationship between constructs	Original sample (O)	T statistics (|O/STDEV|)	P values
Infrastructure -> Student Learning Motivation -> Student Achievement	0.243	1.809	0.070
Online Learning Method -> Student Learning Motivation -> Student Achievement	0.212	1.981	0.048

Source: Smart PLS Output (2022)

It can be concluded that hypothesis 6 is rejected because the t-statistic value of 1.809 is smaller than 1.96 and the P-value of 0.070 is greater than 0.05, so the original sample value is negative, namely 0.243, which means that infrastructure facilities have a negative effect and have no significant effect on student achievement with student learning motivation as a mediating variable. And for hypothesis 7, it is accepted because the t-statistic value of 1.981 is greater than 1.96 and the P-Value value of 0.048 is smaller than 0.05, so the original sample value is positive, namely 0.212, which means, online learning methods have a significant effect on student achievement with student learning motivation as a mediating variable.

CONCLUSIONS

Based on the results of research on the Effect of Infrastructure on Student Achievement through Student Learning Motivation during the COVID-19 pandemic at SMK Negeri 9 Jakarta, it can be concluded that infrastructure facilities and online learning methods do not have a significant effect on student achievement. Although the infrastructure for online learning, the fun online learning method does not affect student achievement. Student learning motivation has a significant influence on student achievement. Infrastructure facilities and learning methods support students in achieving their learning achievements. Infrastructure facilities have a significant effect on student achievement mediated by learning motivation. However, online learning methods do not significantly affect student achievement mediated by learning motivation.

It is better if the school can work together in building student learning motivation by working with parents. Because when learning online, it is challenging for teachers to monitor whether their students are learning. Because of this, teachers must be able to work with parents to help monitor children who are studying at home. Likewise, infrastructure, although it does not directly affect achievement, the completeness of infrastructure supporting learning at home makes students motivated to learn and can also improve rankings. Because the easier the supporting infrastructure is, the more motivated children are to give their best and improve student achievement.

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