



The Relationship Between Learning Motivation and Completeness of Practicum Facilities with Learning Outcomes in Engine Maintenance of Class XI TKR Students of SMKN 5 Medan in the 2024/2025 Academic Year

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ABSTRACT

This research aims to determine the magnitude of the relationship between learning motivation and completeness of practicum facilities together with learning outcomes for engine maintenance in class XI Light Vehicle Engineering students at SMK N 5 Medan. Based on data analysis, it shows that: there is a positive and meaningful relationship between learning motivation and learning outcomes in engine maintenance training courses ($r = 0.750$). There is a positive and meaningful relationship between the completeness of practical facilities and learning outcomes for engine maintenance training courses ($r = 0.787$). The results of the analysis show that the coefficient of determination between learning motivation and completeness of practical facilities, while the learning outcomes for engine maintenance training courses are $R^2_{y1.2} = 0.750$.

INTRODUCTION

Education plays an important role in improving the quality of human resources. With education, a person will be able to equip his life with various experiences. As stated in the National Education System Law No. 20 of 2003 (UU SPN, 2003) that:

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual strength, religiousness, self-control, personality, intelligence, noble morals and the skills needed by themselves, society, nation and state.

Education can be obtained from formal education and non-formal education. One of the formal educational institutions is vocational high schools (SMK). SMK is responsible for preparing its graduates to become skilled and qualified workers in certain fields as emphasized in the explanation stating that "Vocational Education is secondary education that prepares students primarily to work in certain fields.

According to the Regulation of the Minister of Education and Culture No. 34 of 2018, the specific objectives of Vocational High Schools (SMK) are to: (1) Prepare students to enter the workforce and develop professional attitudes (2) Prepare students to be able to choose a career, be able to compete, and be able to develop themselves (3) Prepare an independent middle-level work ethic and/or to fill the needs of the business world and industry at present and in the future.

However, this is not in accordance with the reality at SMK Negeri 5 Medan. There are still many students who have low learning outcomes, which can be seen from the students' daily exam scores. From the results of the researcher's research and interviews on May 5, 2023 with a light vehicle engine maintenance subject teacher, it was also explained that the learning outcomes obtained by the students were still far from what was expected. The learning outcomes of SMK N 5 Medan students on the main material of understanding engine maintenance are still many below the Minimum Completion Criteria (KKM), which is 75. This can be seen from the list of students' daily exam scores on the engine maintenance material. Initial observation data was obtained by the author from the list of Daily Scores of SMK N 5 Medan Students.

Low learning outcomes are an indication that students are not fully able to receive lessons well at school. So with the learning outcomes, people can know how far students can capture, understand, and have the material. Motivation is very important for every student to have, so that it encourages students to be more enthusiastic in learning, as well as learning discipline. Learning discipline will encourage students to have an understanding of how to learn

Learning motivation is a system that students should initially have. If students are interested in learning something, they will get good and satisfying learning results. Student activity in participating in learning activities, theory and practice is a characteristic of students who have learning motivation. Learning motivation that arises from within students makes it possible to get satisfying learning results.

In creating a successful and noble generation of young Vocational High Schools (SMK), one of the components needed to support learning activities is

student learning motivation and completeness of practical facilities at school. However, in terms of completeness, for various reasons, learning facilities, especially in practicals at school, are often not optimally equipped.

From several opinions of the experts above, it can be concluded that motivation is clearly a drive or factor that can influence and direct student behavior in the learning process and have an impact on learning outcomes. If learning motivation is high, then the success of the learning process will be successful so that learning outcomes will also be achieved as expected.

The completeness of the light vehicle engineering expertise program practicum based on the Regulation of the Minister of Education and Culture No. 34 of 2018 is as follows: (1) the light vehicle engineering expertise program practicum room functions as a place to carry out learning activities such as hydraulic systems and air compressors, welding procedures, cutting and hot soldering and heating: overhaul of cooling systems, gasoline fuel systems, clutch units and operating systems, transmissions, final drive/ garden units, wheels and tires, brake systems, steering systems, battery systems, electrical systems, and AC (Air Conditioner) systems. (2) the minimum area of the automotive light vehicle engineering expertise competency practicum room is 150m² includes automotive engine work area, automotive chassis work area, electrical area, Spooling and Balancing, AC work area, and infrastructure room and storage room.

In addition to motivation, completeness of facilities is also a system that supports the success of the learning process. Complete facilities will facilitate teaching and learning activities and realize better learning outcomes. In other words, learning outcomes will be achieved if supported by completeness of practical facilities, thus motivation and completeness of practical facilities have a close relationship with student learning outcomes.

During the learning process, many students are not enthusiastic about learning because they only refer to or focus on the teacher as a facilitator but are not supported by complete practical support facilities, students play around more and tend not to listen to the teacher's directions. Students in class seem less interested or motivated to follow the learning process. So this indicates that motivation and completeness of facilities must be improved and fixed, the lack of motivation and completeness of practical facilities affects the value of student learning outcomes, this obstacle is estimated as one of the causes of low learning outcomes. Based on the description above, the author is interested in conducting research with the title: " *The Relationship Between Learning Motivation and Completeness of Practicum Facilities with Learning Outcomes in Engine Maintenance of Class XI TKR Students of SMKN 5 Medan in the 2024/2025 Academic Year*".

LITERATURE REVIEW

Learning Motivation

The term motivation comes from the word motive which can be interpreted as a driving force that has become active (Sardiman 2016). Motivation is an effort that drives someone to do something. Santrock in (Kompri, 2015) states that motivation is a process that provides enthusiasm, direction, and persistence of behavior. This means that motivated behavior is full of systems,

directed and long-lasting. In line with that, Istirani (2018) emphasized that motivation is an energy in humans that encourages them to do certain activities with certain goals.

Slameto (2010) stated that learning is a process of effort carried out by someone to obtain a new change in behavior as a whole, as a result of his own experience in interacting with his environment. The characteristics of this behavioral change are changes that occur consciously, meaning that someone will be aware of the changes occurring in himself.

According to Hamzah (2017), indicators of learning motivation can be classified as follows: (1) the desire to succeed, (2) the drive to learn, (3) the effort to achieve future goals and (4) the behavior or drive in the form of better actions or deeds.

Completeness of Practicum Facilities

Facilities are everything that can facilitate tasks. More broadly, the meaning of facilities can be interpreted as everything that can facilitate and expedite the implementation of a business. Learning facilities are very much needed in creating quality learning. The absence or completeness of learning facilities makes teaching and learning activities uninteresting. The completeness of the light vehicle engineering expertise program practicum based on the Minister of Education and Culture Regulation No. 34 of 2018 is as follows: (1) clean facilities and places can make you calm in carrying out learning and teaching. (2) safe and comfortable rooms and environments. (3) standard operating procedures (SOP) in the form of supporting equipment for the practicum room. In the process of practicum activities in the workshop, there are several types of equipment used, namely:

1. Hand tools (hand tools),
2. Equipment that uses machine power (power tools), and
3. Special service tools.

Some of the practical tools needed in conducting the practical are: a) hand tools such as wrenches, ring spanners, shock spanners, wrenches, T-spanners, L-spanners, spark plug spanners, alligator pliers, clamping pliers, cutting pliers, plus screwdriver (+), minus screwdriver (-), test pen, iron hammer, rubber hammer, wooden hammer, long roller, short roller, steel ruler, multi tester, vernier caliper. b) special service tools such as tachometer, timing light, exhaust gas tester, coil tester, spring scale, compressor tester, avometer, filler gauge, hydro meter, stethoscope, thread pitch gauge, dial indicator engine tune-up tester and c) power tools such as hydraulic pressure bearing, drill, balancing, lifter stand as a lifter for practical materials, namely engine units, car lifts, jack stands, and hydraulic jacks.

Learning Outcomes in Engine Maintenance

Jamarah (2019) "learning outcomes from an activity that has been done/created either individually or in groups". The learning outcomes achieved by students are known and measured through procedures that can be in the form of tests. One of the subjects that must be taken by students of Light Vehicle Engineering (TKR) expertise competency that greatly supports students'

readiness to achieve competency standards and work in the industrial and business world is maintaining engines. This subject aims for students to have the following competencies: 1) Explaining the main components of a manual engine. 2) explaining the function of the main components of a manual engine, 3) applying the working principles of a manual engine.

The systems expected in maintaining the engine are:

- (1) Implement manual engine maintenance methods
- (2) Explain the main components of a manual engine,
- (3) Explain the function of the main components of a manual engine,
- (4) Applying the working principles of manual engines,
- (5) Periodic manual engine maintenance,
- (6) Identifying manual engine components,
- (7) Maintain manual engine components.

METHODOLOGY

This research has been completed at SMK Negeri 5 Medan, North Sumatra in the 2024/2025 Academic Year. The time of this research was carried out in September 2024. In the Automotive Light Vehicle Engineering (TKRO) expertise competency class XI which has 65 male students, the researcher took one subject to be studied, namely the subject of maintaining light vehicle engines.

The population and sample in this study were all students of class XI Light Vehicle Engineering at SMK Negeri 5 Medan in the 2024/2025 Academic Year, consisting of two classes totaling 65 students.

Research on learning motivation and completeness of practical facilities with learning outcomes in engine maintenance in class *XITKR*¹ and *XITKR*² at State Vocational School 5 Medan using a quantitative method of descriptive correlation type with the following paradigm:

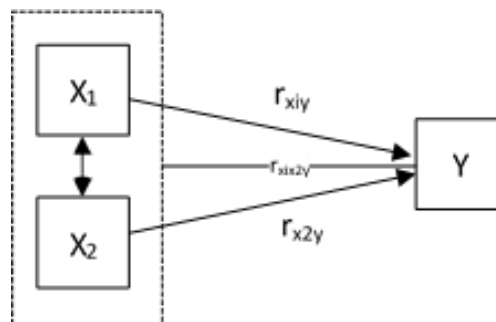


Figure 1. Research Paradigm

The data collection techniques measured consisted of learning motivation data collected with a questionnaire using a Likert scale. Data on the completeness of practical facilities were collected with a questionnaire using a Likert scale. Data on engine maintenance results were collected with a multiple-choice test using Bloom's indicators with the Taxonomy of Education Objectives dividing cognitive aspects into 6 levels, namely remembering, understanding, applying, analyzing, evaluating, creating.

The analysis techniques used are classical assumption tests: linearity and significance regression tests, multicollinearity tests, homogeneity tests, and normality tests. And hypothesis testing by conducting correlation tests, determination coefficient tests, and significance tests. Correlation tests are carried out using product moment correlation tests.

RESEARCH RESULT

Requirements Analysis Testing

1. Linearity and Significance Test of Regression

From the results of the regression line equation analysis of the Learning Outcome variable for Engine Maintenance (Y) on Learning Motivation (X1), namely $Y = 19.452 + 0.804 X$.

Table 1. Summary of Analysis of Variance for the Regression Equation of Variable Y on Variable X1

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1727.669	1	1727.669	81.193	.000*
	Residual	1340.546	63	21.279		
	Total	3068.215	64			

From the table above, it can be seen that the F-Count obtained is 81.193 while the F-table with a significance level of 5% is 3.99. It turns out that $F_h > F_t$ ($81.193 > 3.99$). From these results it can be concluded that the regression line equation is very significant.

Table 2. Summary of Analysis of Variance for Regression Equation of Variable Y on Variable X2

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1902.756	1	1902.756	102.855	.000*
	Residual	1165.460	63	18.499		
	Total	3068.215	64			

Then for the regression line equation of the Learning Outcome variable Maintaining Engine (Y) on the Completeness of Practical Facilities (X2) is $Y = 24.157 + 0.732 X$. From the table above, it can be seen that the F-Count obtained is 102.855 while the F-table with a significance level of 5% is 3.99. It turns out that $F_h \geq F_t$ ($102.855 \geq 3.99$). From these results it can be concluded that the regression line equation is very significant.

Meanwhile, for the multiple regression line equation of the Learning Outcome variable of Engine Maintenance (Y) on Learning Motivation (X1) and Completeness of Practical Facilities (X2) is $Y = 16.222 + 0.368X_1 + 0.481X_2$. From the table below, it can be seen that the F-Count obtained is 61.606 while the F-table with a significance level of 5% is 3.14. It turns out that $F_h \geq F_t$ ($61.606 \geq 3.14$).

From these results it can be concluded that the multiple regression line equation is very significant.

Table 3. Summary of Analysis of Variance for the Regression Equation of Variable Y on Variables X1 and X

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2041.124	2	1020.562	61.606	.000 ^a
Residual	1027.092	62	16.566		
Total	3068.215	64			

a. Dependent Variable: Learning Outcomes To Maintain Engines

b. Predictors: (Constant), Completeness Of Practicum Facilities, Learning Motivation

2. Multicollinearity Test

Table 4. Multicollinearity Test

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	16.222	5.462		2.970	.004		
	Learning Motivation	.368	.127	.344	2.890	.005	.382	2.619
	Completeness Of Practicum Facilities	.481	.111	.517	4.350	.000	.382	2.619

Dependent Variable: Learning Outcomes To Maintain Engines

Based on the output results of the multicollinearity test, the VIF values obtained are as follows: tolerance value > 0.1 and VIF < 10, so it can be concluded that there are no symptoms of multicollinearity between independent variables.

3. Normality Test

Table 5. Normality Test

One-Sample Kolmogorov-Smirnov Test				
		Learning Motivation	Completeness of Practicum Facilities	Learning Outcomes To Maintain Engines
N		65	65	65
Normal Parameters ^a	Mean	68.4000	68.7077	74.4769
	Std. Deviation	6.45852	7.44506	6.92393
Most Extreme Differences	Absolute	.128	.102	.131
	Positive	.128	.102	.131
	Negative	-.115	-.083	-.114
Kolmogorov-Smirnov Z		1.034	.824	1.060
Asymp. Sig. (2-tailed)		.235	.506	.211
a. Test distribution is Normal.				

Based on the SPSS output table, it is shown that the Kolmogorov Smirnov Test price for the variables of Learning Motivation, Completeness of Practical Facilities and learning outcomes of Maintaining Engines are 0.24, 0.51, and 0.21.

This figure is greater than 0.05, thus the data of the variables of Learning Motivation, Completeness of Practical Facilities and learning outcomes of Maintaining Engines are normally distributed.

4. Homogeneity Test

Based on the SPSS output table, it is shown that the significance value of 0.688 is greater than the significance value of 0.05, so the data distribution is homogeneous. Based on the SPSS output table, it is shown that the significance value of 521 is greater than the significance value of 0.05, so the data distribution is homogeneous.

Hypothesis Testing

To test the research hypothesis, simple correlation analysis techniques (product moment), partial correlation analysis techniques and multiple correlation analysis techniques were used. In this study, there were three hypotheses tested, namely: (1) Relationship between Learning Motivation (X1) and Learning Outcomes to Maintain Engines (Y), (2) Relationship between Completeness of Practical Facilities (X2) and Learning Outcomes to Maintain Engines (Y), (3) Relationship between Learning Motivation (X1) and Completeness of Practical Facilities (X2) and Learning Outcomes to Maintain Engines (Y). The following is a further explanation:

Calculation of Correlation Coefficient

Relationship Between Learning Motivation (X1) and Learning Outcomes in Engine Maintenance (Y)

From the calculation results obtained the product moment correlation between Learning Motivation (X1) and learning outcomes Maintaining Engine (Y) is $r_{x1y} = 0.750$ then consulted with r_{table} at a significance level of 5% with a sample size of 65 people ($N = 65$) obtained $r_{table} 5\% = 0.24$. Thus the price of $r_{count} > r_{table}$ at a significance level of 5%, namely $0.750 > 0.24$, then according to the criteria for testing the alternative hypothesis (H_a) is accepted and the null hypothesis (H_o) is rejected.

Furthermore, to see a positive and significant relationship between Learning Motivation (X1) and Learning Outcomes of Engine Maintenance (Y), where the Completeness of Practical Facilities (X2) is controlled, it is done using the partial correlation formula. From the calculation results, the partial correlation coefficient of X1 with Y is 0.345. While r_{table} with $N = 65$ and a significance level of 5% is 0.24. Thus, the value of $r_{count} > r_{table}$ at a significance level of 5%, namely $0.345 > 0.24$, it can be concluded that the first hypothesis (H_a) there is a positive and significant relationship between Learning Motivation (X1) and Learning Outcomes of Engine Maintenance (Y), where the variable X2 is controlled.

Furthermore, a partial correlation severity test was conducted using the t-test, obtained $t_{count} = 9.011$ and $t_{table} = 1.999$, so it can be seen that $t_{count} > t_{table}$, namely $9.011 > 1.999$. Thus, the first hypothesis which states that there is a positive and significant relationship between Learning Motivation and learning

outcomes of Maintaining Engines in class XI TKR students at SMK N 5 Medan, is accepted.

Relationship Between Completeness of Practical Facilities (X2) and Learning Outcomes in Engine Maintenance (Y)

From the results of the product moment correlation calculation between the Completeness of Practical Facilities (X2) and the Learning Outcomes of Engine Maintenance (Y) is $r_{x_2y} = 0.787$, then consulted with the r table price of $5\% = 0.24$, thus $r_{count} > r_{table}$, namely $0.787 > 0.24$, then according to the criteria for testing the alternative hypothesis (H_a) is accepted and the null hypothesis (H_o) is rejected.

Furthermore, to see the pure relationship between the Completeness of Practical Facilities (X2) and Learning Outcomes of Engine Maintenance (Y), where Learning Motivation (X1) is controlled, it is done using the partial correlation formula. From the calculation results, the partial correlation coefficient of X2 with Y is 0.484. While r table with $N = 65$ and a significance level of 5% is 0.24. Thus, the value of $r_{count} > r_{table}$ at a significance level of 5%, namely $0.484 > 0.24$, it can be concluded that the second hypothesis (H_a) there is a positive and significant relationship between the Completeness of Practical Facilities (X2) and Learning Outcomes of Engine Maintenance (Y), where the variable X1 is controlled.

Furthermore, a partial correlation severity test was conducted using the t -test, obtained $t_{count} = 10.142$ and $t_{table} = 1.999$, so it can be seen that $t_{count} > t_{table}$, namely $10.142 > 1.999$. Thus, the second hypothesis which states that there is a positive and significant relationship between the Completeness of Practical Facilities and the learning outcomes of Maintaining Engines in class XI TKR students at SMK N 5 Medan, is accepted.

Table 6. Summary of Product Moment Correlation Coefficients

Correlation	Correlation Coefficient, $N = 65, \alpha = 5\%$	
	r_{hitung}	r_{tabel}
r_{x_1y}	0,750	0,24
r_{x_2y}	0,787	0,24
$r_{x_1x_2}$	0,786	-

Table 7. Summary of Partial Correlation Coefficients of Research Variables

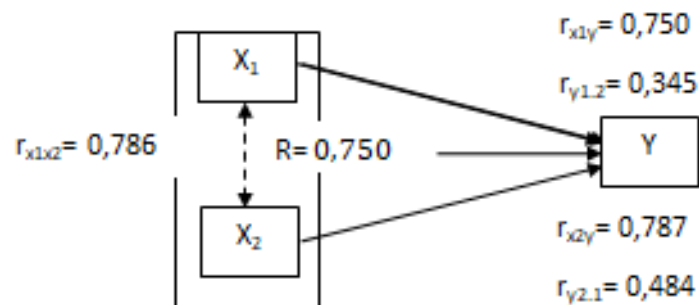
Correlation	Coefficient Correlation, $N = 65, \alpha = 5\%$		
	r_{hitung}	t_{hitung}	t_{tabel}
$r_{y1.2}$	0,345	9,011	1,999
$r_{y2.1}$	0,484	10,142	1,999

Based on the calculation, it is known that the multiple regression coefficient for X1 is 0.368 and X2 is 0.481, so the multiple regression equation is $Y = 16.222 + 0.368 X_1 + 0.481 X_2$.

Furthermore, from the calculation of multiple correlation in appendix 23, the multiple correlation coefficient (R) of and (R^2) of 0.665 is obtained, which

means that 66.5% of the learning outcomes of Engine Maintenance can be explained by Learning Motivation and Completeness of Practical Facilities. Then based on the results of the multiple correlation significance test (F_{count}) which is 61.606 with numerator $dk = 2$ (the number of independent variables) and denominator $dk = n - k - 1 = 65 - 2 - 1 = 62$, at a significance level of 5%, $F_{table} = 3.14$ is obtained. It can be seen that $F_{count} > F_{table}$ at a significance level of 5%, namely $61.606 > 3.14$. Thus, the third hypothesis which states, there is a positive and significant relationship between Learning Motivation and Completeness of Practical Facilities together with the learning outcomes of Engine Maintenance in class XI TKR students at SMK N 5 Medan, is accepted. 0,750

From the table above, the research paradigm can be described as shown below:



Information :

- $r_{x_1y} = 0.750$ is the correlation coefficient between variables X_1 and Y
- $r_{y1.2} = 0.345$ is the partial correlation coefficient between X_1 and Y when X_2 controlled
- $r_{x_2y} = 0.787$ is the correlation coefficient between variables X_2 and Y
- $r_{y2.1} = 0.484$ is the partial correlation coefficient between X_2 and Y when X_1 controlled
- $R = 0.750$ is the multiple correlation coefficient
- $r_{x_1x_2} = 0.786$ is the correlation coefficient between X_1 and X_2

DISCUSSION

Based on the results obtained from data analysis and after conducting tests on class XI TKR students of SMK N 5 Medan in the 2024/2025 academic year, it was generally found:

Relationship between Learning Motivation (X_1) and Learning Outcomes in Engine Maintenance (Y)

From the calculation results of the product moment correlation of variables, it was found that the correlation coefficient value between Learning Motivation and the learning outcomes of Maintaining Engines r_{count} was 0.750 with r_{table} at a significance level of 5% was 0.24. Furthermore, the partial correlation coefficient value was found to be 0.345 with t_{count} of 9.011 and t_{table} at a

significance level of 5% was 1.999. Thus, the alternative hypothesis (H_a) proposed states that there is a positive and significant relationship between Learning Motivation and the learning outcomes of Maintaining Engines has been proven to be true. Thus, H_a is accepted and it can be concluded that the higher the Learning Motivation, the higher the learning outcomes of maintaining engines.

Relationship between Completeness of Practical Facilities (X_2) and Learning Outcomes in Engine Maintenance (Y)

From the results of the product moment correlation calculation of the variable, the correlation coefficient value between the Completeness of Practical Facilities and the learning outcomes of Maintaining Engines was found to be 0.787 with r_{table} at a significant level of 5% of 0.24. Furthermore, the partial correlation coefficient value was found to be 0.484 with t_{count} of 10.142 and t_{table} at a significant level of 5% of 1.999. Thus, the alternative hypothesis (H_a) proposed states that there is a positive and significant relationship between the Completeness of Practical Facilities and the learning outcomes of Maintaining Engines has been proven to be true. Thus, H_a is accepted and it can be concluded that the higher the Completeness of Practical Facilities, the higher the learning outcomes of maintaining engines.

The Relationship between Learning Motivation (X_1) and Completeness of Practical Facilities (X_2) with Learning Outcomes in Engine Maintenance (Y)

From the results of the multiple correlation analysis, the value of the multiple correlation coefficient R was found to be 0.750. Furthermore, the multiple regression equation: $16.222 + 0.368 X_1 + 0.481 X_2$ and after testing the F statistic, which is 61.606 and F_{table} at a significance level of 5%, $F_{table} = 3.14$ was obtained. It can be seen that $F_{count} > F_{table}$ at a significance level of 5%, which is $61.606 > 3.14$.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results described, it can be concluded:

1. There is a positive and significant relationship between Learning Motivation and Learning Outcomes in Maintaining Light Vehicle Engines of Class XI TKR Students of SMK N 5 Medan in the 2024/2025 Academic Year.
2. There is a positive and significant relationship between the Completeness of Practical Facilities and Learning Outcomes in Maintaining Light Vehicle Engines of Class XI TKR Students of SMK N 5 Medan in the 2024/2025 Academic Year.
3. There is a positive and significant relationship simultaneously between Learning Motivation and Completeness of Practical Facilities with Learning Outcomes in Maintaining Light Vehicle Engines of Class XI TKR Students of SMK N 5 Medan in the 2024/2025 Academic Year.

ADVANCED RESEARCH

For further research, it is advisable to use a larger number of samples and add more research variables.

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