Contribution of Student Motivation and Learning Environment to Learning Outcomes in Network System Administration Subjects Majoring in Network Computer Engineering

Salwa Regina Putri⬤, Lativa Mursyida⬤, Almasri⬤, Mahesi Agni Zaus⬤

Department of Electronic Engineering, Faculty of Engineering, Universitas Negeri Padang, Indonesia

*Corresponding Author: salwaregina05@gmail.com

Abstract - The successful attainment of educational objectives is significantly contingent upon students' experiences of the teaching and learning process. Multiple factors influence learning outcomes, including internal ones like motivation and environmental factors such as the learning environment. This study seeks to elucidate: 1. The extent of student motivation's impact on learning outcomes in ASJ topics at SMKN 2 Panyabungan. The extent of the learning environment's impact on educational outcomes in ASJ disciplines at SMKN 2 Panyabungan.The extent of the influence of motivation and learning environment collectively on the academic performance in ASJ subjects at SMKN 2 Panyabungan. This study employs a quantitative research method with a sample size of 98 participants. This study's findings indicate that learning motivation accounts for 48.44% of the learning outcomes. The learning environment accounts for 38.93% of the learning outcomes. Learning motivation and the learning environment collectively account for 48.5% of the learning outcomes in the ASJ subject for class XI students specializing in TKJ at SMKN 2 Panyabungan during the 2023/2024 academic year. Learning motivation and the learning environment influence educational outcomes; enhanced motivation and environment correlate with improved learning results.

Keywords - Learning Motivation, Learning Environment, Learning Outcomes

I. INTRODUCTION

Educational activities are essential in the school learning process. The achievement of educational goals is largely dependent on how students participate in the learning process. Psychological learning is a transforming process marked by behavioral changes that arise from interactions with the environment to meet essential life needs. This modification is evident in all aspects of behavior, and the learning process can be assessed based on learning outcomes.

Student-generated findings following the completion of educational activities are termed learning outcomes. These benefits may encompass enhancements in cognitive, emotional, and psychomotor competencies throughout the learning process [1]. Learning is a deliberate process or activity aimed at altering knowledge, skills, and attitudes. The highest level of accomplishment attained by students is referred to as learning outcomes. Learning outcomes refer to students' capacity to perform distinct actions as a result of their deliberate efforts to modify knowledge, abilities, and attitudes [2].

Learning outcomes are influenced by both internal and external influences. Internal elements originate from the learner and encompass a) comprehension and capability, b) engagement, and c) motivation. External variables originate from outside the student and encompass a) the educational environment, b) the familial environment, and c) the surrounding environment [3].

Motivation is the primary impetus that compels an individual to take action. This drive resides within an individual and compels him to act in alignment with his desires. A person's behaviors, driven by a specific motivation, exhibit a theme that aligns with the underlying motivation [4]. Learning motivation refers to the enthusiasm or impetus to acquire knowledge. Learning motivation refers to the appeal of the significance, worth, and advantages of a learning activity that encourages student participation [5]. Learning motivation is an intrinsic and extrinsic impetus that compels students to engage effectively in educational activities and fosters enduring behavioral transformations [6].

The four fundamental assumptions regarding motivation are as follows: a. Motivation is beneficial; individuals become inspired due to praise, or conversely, individuals labor with motivation and consequently receive acclaim. b. Motivation is a determinant of an individual's work performance, alongside aptitude, resources, working circumstances, leadership, and more elements. c. Motivation can diminish and requires

periodic replenishment, similar to other psychological elements that exhibit cyclical patterns. Motivation serves as a mechanism for management to govern work interactions. Motivation serves as a mechanism for management to regulate interpersonal connections inside the firm [7].

Indicators of learning motivation can be classified into the following categories: a) aspiration and determination for success, b) impetus and ambition for achievement, c) presence of future aspirations and ideals, d) availability of rewards within the learning process, e) presence of engaging educational activities, and f) existence of a supportive learning environment [4].

The educational setting profoundly impacts the cultivation of students' behavioral competencies. The learning environment is typically defined as a context or atmosphere that affects human behavior. The learning environment exerts both direct and indirect effects on student behavior. The learning atmosphere for students must remain conducive to comfort. In order to foster students' behavioral competencies, the educational setting is crucial. An individual's capacity to alter their behavior is influenced by their learning environment. Students are the main focus of research in this setting. [8].

The markers of the educational environment include a) parental education methods, b) familial ties, c) domestic atmosphere, d) economic situations of the family, e) parental comprehension, and f) familial cultural background. The indicators of the school environment include a) pedagogical approaches, b) curriculum design, c) teacher-student interactions, d) peer relationships, e) disciplinary measures, and f) educational facilities. The indicators of the community environment include a) community activities, b) mass media and social media, c) social interactions among friends, and d) other types of community life [3].

Students pursuing a major in Network Computer Engineering (TKJ) will engage in the study of Network System Administration. This topic is mandatory for vocational students enrolled in the TKJ expertise program. Students are anticipated to assume the role of computer network administrators. Network systems administration encompasses the expertise and competencies required for the management and oversight of a computer network infrastructure. It encompasses comprehension of computer network operations and the capability to establish, administer, and sustain those networks for optimal efficiency and security.

Document review at SMKN 2 Panyabungan indicates that the Criteria for Achievement of Learning Objectives (KKTP) established by the institution is set at ≥70. However, field surveys conducted among class XI students reveal that their learning outcomes in the subject of Network System Administration fall below this established criterion. This research seeks to elucidate 1) the extent of student motivation's impact on learning outcomes in ASJ subjects at SMKN 2 Panyabungan, 2) the extent of the learning environment's impact on learning outcomes in ASJ subjects at SMKN 2 Panyabungan, and 3) the combined effect of motivation and the learning environment on the learning outcomes of ASJ subjects at SMKN 2 Panyabungan.

II. METHODS

Quantitative methods are used in the applied research. The research methodology that is used is quantitative research. It is used to study specific groups or samples, gather information using research tools, and test ideas through statistical or quantitative analysis [9]. This study employs a quantitative strategy via statistical data processing.

The study population comprised 98 students from class XI TKJ, distributed among three classrooms during the 2023-2024 academic year. The research sample was acquired by a comprehensive sampling approach. Total sampling is a methodology wherein every individual in the population is employed as a sample. The study sample consisted of 98 participants.

Questionnaires are the main tool for gathering information in quantitative research. Research variables, often called physical research variables, are used to quantify observed social and natural events through the use of research instruments. Upon establishing the operational definitions of these variables, the indicators for measurement are chosen. These indications are further categorized into various questions and statements [9]. Researchers employ Likert scales to assess the attitudes, views, and perceptions of individuals or groups about social issues.

Indicators for assessing learning motivation variables (X1) and the learning environment (X2) are established following an analysis of the previously discussed theoretical investigations. The indicators for the learning motivation variable are: 1) The existence of ambition and a pursuit of achievement, 2) The availability of support and requirements in the educational process, 3) The presence of dreams and aspirations for the future, 4) Recognition and appreciation in learning, 5) Engaging activities in the learning environment, 6) A conducive learning atmosphere that facilitates effective student learning.

Indicators of learning environment variables include: 1) Parental educational practices, 2) Domestic atmosphere, 3) Familial economic status, 4) Teacher-student relationships, 5) Educational facilities, 6) Mass and social media influence, 7) Social interactions with peers. The utilized data analysis method is the preliminary descriptive data. The description is to clarify the mean, mode, median, and standard deviation to define the data distribution. The second part is the tests for pre-analysis, which include things like multicollinearity, homogeneity, linearity, and normalcy [10].

The normality test evaluates if the study data adheres to a normal distribution. This transpires following the clarification of data testing, which produces normally distributed data [11]. The homogeneity test in statistical analysis evaluates whether two or more sample groups derive from populations with equivalent variances [12]. Use the linearity test to find out if the relationship between the two variables is linear. Performing the multicollinearity test allows one to ascertain the level of significant correlation among the independent variables in a multivariate linear regression model [13].

The third data analysis technique is hypothesis testing, utilizing the product moment correlation, defined by Karl Pearson, to determine the correlation coefficient between two variables, both measured on an interval scale [14]. If t-value>

critical t-value, the hypothesis is accepted; conversely, if t-value< critical t-value, the hypothesis is rejected [15]. The hypotheses put forward in this study are as follows: 1.There is a contribution of motivation to the learning outcomes of Network System Administration subjects in class XI students majoring in TKJ at SMKN 2 Panyabungan 2.

There is a contribution of the learning environment to the learning outcomes of Network System Administration subjects in class XI students majoring in TKJ at SMKN 2 Panyabungan 3. There is a contribution between motivation and learning environment together to the learning outcomes of Network System Administration subjects in class XI students majoring in TKJ at SMKN 2 Panyabungan. The Adjusted R^2, the coefficient of determination, measures how much the independent factors explain the dependent variable when taken as a whole [16].

III. RESULT AND DISCUSSION

A. Instrument Testing

1) Validity Test

Validity is an assessment that demonstrates the legitimacy of an instrument. [17]. The validity test revealed that 2 of the 24 statements about the learning motivation variable are invalid, while 9 of the 28 statements concerning the learning environment variable are invalid.

2) Reliability Test

Reliability is a collection of measurements or measuring instruments that are consistent if measurements are made with the same measuring instrument repeatedly [17]. Based on the reliability test conducted using SPSS, the results obtained were

TABLE I
TEST THE RELIABILITY OF VARIABLE X1

Cronbach's Alpha SPSS	Cronbach's Alpha Excel	N of items
0,946	0,946	24

TABLE II
TEST THE RELIABILITY OF VARIABLE X1

Cronbach's Alpha SPSS	Cronbach's Alpha Excel	N of items
0,900	0,900	28

In the table 1 and 2, the reliability test findings for the Learning Motivation variable (X1) indicate a Cronbach's alpha of 0.946, over the threshold of 0.60. Similarly, the learning environment variable (X2) has a Cronbach's alpha of 0.900, also surpassing 0.60. These results demonstrate that all assertions in the variable questionnaire (X1) and (X2) are deemed reliable.

B. Data Analysis Technique

1) Descriptive Data

a. Learning Motivation (X1)

Data regarding learning motivation characteristics were gathered via a questionnaire comprising 22 validated and reliable statement items. The questionnaire was administered to 98 respondents for completion. Computation of fundamental statistics for learning incentive variables utilizing SPSS, specifically:

TABLE III
CALCULATION RESULTS OF LEARNING MOTIVATION

N	98
Mean	81,70
Median	81
Mode	74
Std. Devitation	15,515
Variance	240,726
Range	66
Minimum	44
Maksimum	110
Sum	8007

In the table 3, it can be seen that the n value is 98, the mean is 87.70, the median is 74, the std.deviation is 15,515, the variance is 240,726, the range is 66, the minimum value is 44, the maximum value is 110 and the sum is 8007.

b. Learning Environment (X2)

Data regarding learning environment characteristics were gathered using a questionnaire comprising 19 validated and reliable statement items. Furthermore, the questionnaire was given to 98 respondents to be filled in. Calculation of basic statistics of learning motivation variables with SPSS.

TABLE IV
CALCULATION RESULTS OF LEARNING ENVIRONMENT

N	98
Mean	69,42
Median	69
Mode	65
Std. Devitation	13,349
Variance	178,184
Range	56
Minimum	39
Maksimum	95
Sum	6803

In the table 4, it can be seen that the n value is 98, the mean is 69,42, the median is 69, the std.deviation is 13,349, the variance is 178,184, the range is 56, the minimum value is 39, the maximum value is 95 and the sum is 6803.

c. Study Outcomes (Y)

Calculation of basic statistics of Learning Outcomes variables with SPSS.

TABLE V
STATISTICAL CALCULATION OF LEARNING OUTCOMES

N	98
Mean	62,07
Median	61
Mode	48
Std. Devitation	13,655
Variance	186,459
Range	49
Minimum	37
Maksimum	86
Sum	6083

In the table 5, it can be seen that the n value is 98, the mean is 62,07, the median is 61, the std.deviation is 13,655, the variance is 186,459, the range is 49, the minimum value is 37, the maximum value is 86 and the sum is 6083.

2) Prerequisite Analysis Test
a. Normality Test

The significance level (Sig) should be greater than 0.05 to show normal distribution, and it should be less than 0.05 to indicate non-normal distribution; this study used SPSS to perform the normality test. Following these steps will ensure a successful normality test.

TABLE VI
Learning Motivation Normality Test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig	Statistic	df	Sig
motivation	0,073	98	0,200	0,973	98	0,039

In the table 6, the data on learning motivation for students in grade XI TKJ at SMKN 2 Panyabungan in the 2023–2024 school year follows a normal distribution, as shown in the table, where the significance value is greater than 0.05.

TABLE VII
LEARNING ENVIRONMENT NORMALITY TEST

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig	Statistic	df	Sig
environment	0,059	98	0,200	0,980	98	0,134

In the table 7, Class XI TKJ SMKN 2 Panyabungan data for the 2023–2024 school year follows a normal distribution, since the significance value > 0.05, as shown in the table.

TABLE VIII
LEARNING OUTCOMES NORMALITY TEST

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig	Statistic	df	Sig
outcomes	0,097	98	0,024	0,958	98	0,003

In the table 7, the data on class XI TKJ's learning outcomes from the 2023–2024 school year at SMKN 2 Panyabungan follows a normal distribution, as shown in the table, where the significance value is greater than 0.05.

b. Homogeneity Test

The homogeneity test if with SPSS using the Levene test the test procedure is:

Ho: "The population variance is homogeneous

Ha: The population variance is not homogeneous"

"If the probability (sig) > 0,05 then Ho is accepted

If the probability (sig) < 0,05 then Ho is rejected"

The following is a test of homogeneity between variables using SPSS:

TABLE IX
LEVENE TEST OF LEARNING MOTIVATION AND LEARNING OUTCOMES

		Levene Statistic	df1	df2	sig
Motivation	Based on Mean	1,327	1	194	0,251
	Based on Median	1,284	1	194	0,259
	Based on Median and with adjusted df	1,284	1	186,603	0,259
	Based on trimmed mean	1,330	1	194	0,250

Table 9 indicates a significance value of 0.251, which exceeds 0.05, signifying that the two datasets possess homogeneous or identical variances.

TABLE X
LEVENE TEST OF LEARNING ENVIRONMENT AND LEARNING

		Levene Statistic	df1	df2	sig
Environment	Based on Mean	0,878	1	194	0,350
	Based on Median	0,831	1	194	0,363
	Based on Median and with adjusted df	0,831	1	191.312	0,363
	Based on trimmed mean	0,888	1	194	0,347

Table 10 indicates a significance value of 0.350, which exceeds 0.05, signifying that the two datasets possess homogeneous or identical variances.

c. Linearity Test

The foundation for decision-making about the linearity test utilizing SPSS is as follows: "If the significance of linearity value is less than 0.05, a linear relationship exists between the independent variable and the dependent variable. If the significance of linearity is greater than 0.05, then no linear relationship exists between the independent and dependent variables". The following is linearity testing using SPSS

TABLE XI
LINEARITY TEST OF LEARNING MOTIVATION - LEARNING OUTCOMES

			Sum of Squares	df	Mean Square	F	Sig.
learning outcomes*learning motivation	Between Groups	(Combined)	13523,500	44	307,352	3,570	0,000
		Linearity	8748,961	1	8748,961	101,621	0,000
		Deviation from Linearity	4774,539	43	111,036	1,290	0,188
	Within Groups		4563,000	53	86,094		
	Total		18086,500	97			

There is a linear relationship between the learning motivation and learning outcomes variables, as shown in the table 11, where the linearity significance value is less than 0.05.There is a linear relationship between the learning motivation and learning outcomes variables, as shown in the table, where the linearity significance value is less than 0.05.

TABLE XII
LINEARITY TEST OF LEARNING ENVIRONMENT - LEARNING OUTCOMES

			Sum of Squares	df	Mean Square	F	Sig.
learning outcomes*learning Environment	Between Groups	(Combined)	13933,283	46	302,897	3,719	0,000
		Linearity	7040,362	1	7040,362	86,453	0,000
		Deviation from Linearity	6892,921	45	153,176	1,881	0,015
	Within Groups		4153,217	51	81,436		
	Total		18086,500	97			

With a linearity significance value lower than 0.05, as shown in the table 12, we can conclude that the learning environment variable has a linear relationship with the learning outcomes.

d. Multicollinearity Test

Here we will use SPSS with the Tolerance & VIF method with the test criteria: If the Tolerance value exceeds 0.100 and the VIF is less than 10.00, then there are no indications of multicollinearity. If the Tolerance number is less than 0.100 and the VIF exceeds 10.00, then indications of multicollinearity are present.

TABLE XIII
MULTICOLLINEARITY TEST WITH TOLERANCE AND VIF

Model		Collinearity Statistics	
		Tolerance	VIF
1	Learning motivation	0,244	4,105
	Learning environment	0,244	4,105

According to the data in the table 13, both learning motivation and the learning environment have Tolerance values higher than 0.100 and VIF values lower than 10.00. Thus, it follows that multicollinearity indicators do not exist.

3) Hypothesis Test

Hypotheses 1 through 2 were tested with a simple correlation test while hypothesis 3 was tested with multiple correlation analysis.

a. The First Hypothesis

Class XI TKJ majors at SMKN2 Panyabungan are expected to do better in ASJ classes if they are intrinsically motivated to study, according to the first premise.

Hypothesis testing utilizing SPSS reveals the findings of the T test concerning the impact of learning motivation (X1) on learning outcomes (Y) as follows:

TABLE XIV
T TEST RESULTS OF THE EFFECT OF LEARNING MOTIVATION (X1) ON LEARNING OUTCOMES (Y)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std.Error	Beta	t	Sig.
1	(Constant)	12,059	5,367		2,247	0,027
	x1	0,612	0,065	0,696	9,484	0,000

In table 14, it can be seen learning motivation (X1) has a 0.000 significance value, which is less than 0.05, and a t-count value of 9.484, which is greater than the t-table value of 1.985. Hence, we can accept H1 and infer that learning motivation (X1) significantly affects learning outcomes (Y).

TABLE XV
CORRELATION COEFFICIENT OF THE EFFECT OF LEARNING MOTIVATION (X1) ON LEARNING OUTCOMES (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,696	0,484	0,478	9,862

In the table 15, it can be seen the R Square value is 0.484, indicating that the learning motivation variable (X1) accounts for 48.4% of the variance in learning outcomes (Y) (partially), with the remainder impacted by other variables not considered in this study.

b. The Second Hypothesis

The second hypothesis posits a correlation between the learning environment and the academic outcomes of ASJ topics for eleventh-grade students specializing in TKJ at SMKN2

Panyabungan. Hypothesis testing with SPSS, specifically about the findings of the T-test assessing the impact of the learning environment (X2) on learning outcomes (Y).

TABLE XVI
T TEST RESULTS OF THE EFFECT OF LEARNING ENVIRONMENT (X2) ON LEARNING OUTCOMES (Y)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std.Error	Beta	t	Sig.
1	(Constant)	17,767	5,767		3,081	0,003
	X2	0,638	0,082	0,624	7,822	0,000

In the table 16, it can be seen the t-count value of 7.822 is greater than the t-table value of 1.985, and the significance value for the learning environment (X2) with respect to the learning outcomes (Y) is 0.000, which is less than 0.05. Thus, it is reasonable to assume that H1 is correct, suggesting that X2 has a substantial impact on Y, the learning outcomes.

TABLE XVII
CORRELATION COEFFICIENT OF THE EFFECT OF LEARNING ENVIRONMENT (X2) AGAINST LEARNING OUTCOMES (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,624	0,389	0,383	10,727

In the table 17, it can be seen the R Square value is 0.389, indicating that the learning environment variable (X2) accounts for 38.9% of the variance in learning outcomes (Y), with the remainder attributable to other variables not considered in this study.

c. The Third Hypothesis

The third hypothesis posits that both learning motivation and learning environment collectively influence the learning results of ASJ subjects for class XI students specializing in TKJ at SMKN 2 Panyabungan. The third hypothesis was evaluated by multiple correlation analysis (F test). Then testing the hypothesis using SPSS is as follows:

TABLE XVIII
CORRELATION COEFFICIENT OF THE EFFECT OF LEARNING MOTIVATION (X2) AND LEARNING ENVIRONMENT (X2) TOGETHER ON LEARNING OUTCOMES (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,697	0,485	0,474	9,900

In the table 18, it can be seen the R Square value is 0.485, indicating that the combined influence of learning motivation variables (X1) and the learning environment (X2) on learning outcomes (Y) accounts for 48.5% of the variance.

TABLE XIX
F COUNT LEARNING MOTIVATION (X2) AND LEARNING ENVIRONMENT (X2) AGAINST LEARNING OUTCOMES (Y)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8775,803	2	4387,901	44,771	0,000
	Residual	9310,697	95	98,007		
	Total	18086,50	97			

The regression model can be used to predict the learning outcome variable, since the Fcount value in the table 19 is 44.771 and the significance level is 0.000 (<0.05). This

provides more evidence that the learning environment and the learning incentive variable are both influential in shaping learning results.

TABLE XX
T TEST RESULTS THE EFFECT OF LEARNING MOTIVATION (X2) AND LEARNING ENVIRONMENT (X2) TOGETHER ON LEARNING OUTCOMES (Y)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std.Error	Beta		
1	(Constant)	11,398	5,533		2,060	0,042
	motivation	0,552	0,131	0,628	7,822	0,000
	environment	0,080	0,153	0,78	0,523	0,602

Table 20 indicates that the constant value (a) is 11.398, while the regression coefficients X1 and X2 (b) are 0.552 and 0.80, respectively, allowing the regression equation to be formulated.

$$Y = a + b1X1 + b2X2$$
$$Y = 11,389 + 0,552 + 0,80$$

The learning outcomes variable has a consistent value of 11.398. With an X1 regression coefficient of 0.552, we can see that there is a 0.552 rise for every 1% increase in learning motivation. With an X2 regression coefficient of 0.080, we can see that there is a 0.080 rise for every 1% increase in the value of the learning environment. A positive coefficient means that X1 and X2 have a positive effect on Y.

Learning motivation (X1) has a 0.000 significance value, which is less than 0.05, and a t-count value of 7.822, which is greater than the t-table value of 1.985. So, it may be said that H1 is accepted, suggesting that X2 has an effect on Y, the learning results.

Decision Making in multiple regression tests the R Square value of 0.485 indicates that the independent factors, namely learning motivation and learning environment, account for 48.5% of the variance in the dependent variable, learning outcomes. With a 0.000 significance level—less than 0.05—the Fcount value is 44.71, surpassing the Ftabel. Given that X1 and X2 are variables that pertain to learning motivation and the learning environment, respectively, the regression model can be used to forecast Y, the learning result variable.

C. Discussion

Findings from this study revealed that out of 98 students surveyed, 41 statement items were examined to determine the effects of learning environment on learning outcomes, learning motivation on learning outcomes, and the combined effect of both components. This study elucidates various findings derived from data analysis and hypothesis testing, namely 1. the Impact of Learning Motivation on Academic Performance in ASJ Subjects for Eleventh Grade Students of the TKJ Department at SMKN 2 Panyabungan, hypothesis testing has shown that there is a connection between students' intrinsic motivation to study and their actual performance in the classroom.

We reject H0 and accept H1 based on the data analysis results, which show that there is a link between students' learning desires and their actual learning outcomes (rcount = 0.696 vs. rtable = 0.1946), 2. Impact of Learning Environment on Learning Outcomes of ASJ Subjects for Class XI Students in the TKJ Department at SMKN 2 Panyabungan, testing the

second hypothesis yielded the conclusion that there is a connection between the classroom setting and the results that students achieve academically. Based on the data analysis, we can reject H0 and accept H1, which means that there is a connection between the learning environment and student learning outcomes. This is because rcount (0.624) is greater than rtable (0.1986).

Learning motivation considerably influences learning outcomes, accounting for 38.93% of the contribution percentage. In comparison to the learning motivation percentage of 48.44%, the contribution of the learning environment is, in fact, lesser. The classroom environment significantly influences student learning outcomes. A good learning atmosphere enhances pupils' academic outcomes.

This corresponds with the findings from interviews with students, which indicated that the familial environment significantly influences their everyday learning activities. Family members provide motivation and support, inquire about their learning process, and assist them when they face difficulties. In addition to the family environment, the school environment also influences students' learning processes. Students feel that school facilities, particularly laboratories for practical work, greatly aid their learning, especially since many ASJ (Applied Science and Technology) topics are easier to understand through hands-on practice. Furthermore, social media is viewed by many students as a tool that can enhance their learning; however, its effectiveness depends on how it is used, as some students use social media solely for entertainment purposes.

The Impact of Learning Motivation and Learning Environment on the Academic Performance of XI Grade Students in the ASJ Subjects within the TKJ Major at SMKN 2 Panyabungan, the results of the hypothesis testing show that both the learning environment and students' enthusiasm to study have a significant and positive effect on students' final grades. The data analysis shows that the F-count (44.88) is greater than the F-table (3.092), which means that H0 is rejected and Ha is accepted. It follows that the two independent variables, learning environment and learning motivation, have an effect on the dependent variable, learning outcomes. According to the contribution percentage, learning environment and learning motivation account for 48.58 percent of the learning outcomes.

The study findings are corroborated by expert perspectives articulated in the theoretical review. Sstate that the factors affecting learning outcomes can be classified into two categories: internal factors and external factors. The interaction of these two components influences the individual's learning process, hence affecting the quality of learning outcomes. According to this professional opinion, learning outcomes are affected by both internal and external influences. Internal factors comprise psychological elements like motivation, and external factors involve environmental impacts, encompassing both social and non-social contexts.

The findings of this research are corroborated by the perspectives of other experts, who elucidate that a student's academic performance is affected by multiple elements. These factors comprise internal and external elements.

Based on relevant research, this study is in line with research conducted by Krisyanto [18] in his research his research

"Contribution Of Study Motivation And Learning Environment To Learning Results In Eyes Work Safety And Health (K3) Lesson At Smk Negeri 1 Magelang 2019/2020 School Year" concluded that learning motivation partially contributed 21.7% to student learning outcomes. The Learning Environment partially contributed 32.6% to student learning outcomes. Learning Motivation and Learning Environment simultaneously have a contribution of 54.3 to student learning outcomes. The results of the research compiled by the researcher show that the better the motivation and learning environment of students, the higher the student learning outcomes and vice versa.

IV. KESIMPULAN

From the research findings, the subsequent conclusions can be inferred Learning motivation accounts for 48.44% of the learning outcomes in the ASJ subject for XI grade students in the TKJ program at SMKN 2 Panyabungan for the academic year 2023/2024. Learning motivation in school profoundly impacts the outcomes attained, The learning environment contributes 38.93% to the learning outcomes in the subject of ASJ for XI grade students in the TKJ program at SMKN 2 Panyabungan for the academic year 2023/2024. This indicates that the learning environment in education also affects the results they obtain, Learning motivation and the learning environment collectively account for 48.5% of the learning outcomes in the ASJ subject for "XI grade students in the TKJ program at SMKN 2 Panyabungan for the academic year 2023/2024".

Both learning motivation and the learning environment significantly affect learning outcomes; enhanced motivation and a conducive learning environment yield superior results. This study has limitations in terms of data collection methods that only rely on questionnaires, so there could be bias in respondents' answers. In addition, this study was only conducted in one school, so the results may not be generalizable to a wider context. For future research, it is recommended that a study be conducted with both qualitative and quantitative approaches to gain a deeper understanding. The study could also broaden the scope by involving several schools in different regions and considering other factors such as family support and students socio-economic conditions that may affect learning outcomes.

REFERENCES

[1] Nuridayanti, "Mengembangkan Motivasi dan Hasil Belajar dengan Pendekatan Problem Posinge," Jawa Tengah: Jawa Tengah: Penerbit NEM, 2022.

[2] R. Ananda and F. Hayati, *Variabel Belajar: Kompilasi Konsep*. 2020.

[3] R. Hidayat and Abdillah, *Ilmu Pendidikan Konsep, Teori dan Aplikasinya*. Lembaga Peduli Pengembangan Pendidikan Indonesia (LPPPI), 2019.

[4] Hamzah B. Uno, *Teori Motivasi dan Pengukurannya Analisis di Bidang Pendidikan*. Jakarta:Bumi Aksara, 2023.

[5] S. B. Sartika, *Buku Ajar Belajar Dan Pembelajaran*. 2022. doi: 10.21070/2022/978-623-464-043-4.

[6] Rasidi and M. Salim, *Pola Asuh Anak dalam Meningkatkan Motivasi Belajar*. Jawa Timur : Academia Publication, 2021.

[7] K. Khanafi and H. Hidayatullah, "Manajemen Motivasi Islam," *TADRIBUNA J. Islam. Educ. Manag.*, vol. 2, no. 2, pp. 12–26, 2022, doi: 10.61456/tjiec.v2i2.16.

[8] Harjali, *Penataan Lingkungan Belajar Strategi Untuk Guru Dan Sekolah*. Malang:CV. Seribu Bintang, 2019. [Online]. Available: www.fb.com/cv.seribu.bintang

[9] Sugiyono, *Metode penelitian kuantitatif kualitatif dan R&D*. Bandung: Bandung:Alfabeta, 2020.

[10] D. Yulia, M. Permata, and M. Anwar, "Analysis of Critical Thinking Skills on the Use of Augmented Reality with the TAM Approach", Vol. 1 No. 1 (2024): Journal of Engineering and Collaborative Learning (IJECL), https://ijecl.ppj.unp.ac.id/index.php/ijecl/article/view/4/4

[11] Dewi Widyaningsih, *Statistika Bisnis*. Semarang:Yayasan Prima Agusteknik, 2021.

[12] W. Widana and P. L. Muliani, *Buku Uji Persyaratan Analisis*. 2020.

[13] I. Rodliyah, *Pengantar Dasar Statistika Dilengkapi Analisis Dengan Bantuan Software SPSS*. Jawa Timur:LPPM UNHASY Tebuireng Jombang, 2021. [Online]. Available: http://www.lppm.unhasy.ac.id.

[14] L. Rosalina, R. Oktarina, Rahmiati, and I. Saputra, "Buku Ajar Statiska," *FEBS Lett.*, vol. 185, no. 1, pp. 4–8, 2023.

[15] M. F. Kalid, "The Influence of Electro Pneumatic Trainer Media in the Subject of Industrial Electronics Engineering for Industrial Control System Elements at State Vocational High School 5 Padang," Vol. 1 No. 1 (2024): Journal of Engineering and Collaborative Learning(IJECL), https://ijecl.ppj.unp.ac.id/index.php/ijecl/article/view/5/2

[16] & C. Abdurrahman, *Struktur Modal Sebagai Variabel Moderasi*. Semarang: UPT UNDIP Press, 2020.

[17] S. Widodo and Dkk, *Buku Ajar Metode Penelitian*. Pangkalpinang: CV Science Techno Direct Perum Korpri, 2023.

[18] D. A. Krisyanto and Tawardjono, "Kontribusi Motivasi Belajar Dan Lingkungan Belajar Terhadap Hasil Belajar Pada Mata Pelajaran Keselamatan Dan Kesehatan Kerja (K3) Di SMK Negeri 1 Magelang Tahun Ajaran 2019/2020," vol. 3, no. 1, pp. 55–62, 2021.