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The Influence of School Environment and Learning Motivation on Learning Independence in Deep Learning of Culinary Arts Students at SMK N 6 Semarang

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ABSTRACT

This study falls within the field of vocational education, specifically examining student learning autonomy in deep learning at vocational high schools. The purpose of this study is to analyze the influence of the school environment and learning motivation on the learning autonomy of 11th-grade students in the culinary arts program at State Vocational High School 6 in Semarang. This study employs a quantitative approach with an ex post facto design. The study population consisted of 139 students, while the sample of 103 students was determined using the Slovin formula and proportionate random sampling. Data were collected through questionnaires and documentation, then analyzed using validity and reliability tests, descriptive analysis, classical assumption tests, simple regression, multiple regression, and the coefficient of determination. The results indicate that the school environment and learning motivation have a positive and significant effect on learning autonomy, both partially and simultaneously. Learning motivation has a more dominant influence than the school environment. Together, these two variables account for 58.7% of the variation in students' learning autonomy. This study contributes to the development of vocational education research by emphasizing the importance of a supportive school environment and strengthening learning motivation in fostering students' learning autonomy.

Keywords: School Environment, Motivation to Learn, Independent Learning, Deep Learning, Graduate Profile

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INTRODUCTION

Developments in national education policy have positioned the deep learning approach as a key strategy for improving the quality of education, particularly at the Vocational High School level. This approach requires students not only to understand the material but also to think critically and reflectively and to apply their

knowledge in real-world situations. In this context, independent learning is a crucial skill, as students need to actively and responsibly manage their own learning process. The implementation of the Merdeka Curriculum further strengthens the application of deep learning by reinforcing the eight aspects of the graduate profile: faith and piety toward God Almighty, citizenship, critical thinking, creativity, cooperation, communication, health, and self-directed learning. (Kementerian

Pendidikan & Menengah, 2025; Badan Standar, Kurikulum, 2025).

Independent learning is one of the key characteristics in the graduate profile, as students are expected to be able to develop their full potential and possess lifelong learning skills to prepare them for future changes and challenges (Kementerian Pendidikan & Menengah, 2025).

In the context of deep learning, this ability is a key indicator because students are required to actively and reflectively manage their learning process so that they can understand concepts more meaningfully (Badan Standar, Kurikulum, 2025). This situation impacts graduates' readiness to face the dynamics of the workforce, particularly in culinary programs that demand creativity, precision, and independent decision-making based on industry standards (Wulandari et al., 2026).

According to Garrison (1997)), autonomous learning involves the dimensions of self-management, self-motivation, and self-monitoring. Factors influencing self-directed learning include self-efficacy (Bandura et al., 1999), intrinsic motivation (Ryan & Deci, 2020), and support from the learning environment (Schunk & Greene, 2017). Based on Ryan & Deci (2017) Self-Determination Theory, intrinsic motivation is a key element in deep learning because it fosters exploration, curiosity, and meaningful mastery of competencies. Self-regulated learning is defined as an individual's ability to independently plan, monitor, and evaluate the learning process (Zimmerman, 2000). This concept aligns with Knowles (1975) concept of self-directed learning, which emphasizes students' initiative in determining

their learning needs and strategies. In vocational education particularly in culinary programs self-regulated learning is a critical competency because students are expected to make independent decisions, think creatively, adapt, and apply skills in accordance with industry standards. These conditions align with the characteristics of vocational education, which emphasizes the integration of the learning process at school with the real-world needs of the workplace ((Nurjanah et al., 2022; Wulandari et al., 2026).

The school environment is an external factor that plays a role in the development of students' independent learning. According to Slameto (2013), a conducive school environment can support the learning process, encouraging students to be more active and take greater responsibility for their own learning. Furthermore, Knowles (1975) theory of self-directed learning explains that a supportive learning environment helps students develop the ability to independently manage and direct their own learning process. Thus, the more positive the school environment is, the greater students' learning autonomy becomes.

The school environment is an external element that plays a significant role in shaping students' learning behavior. Within a theoretical framework, the school environment is defined as external factors including physical facilities, social climate, and institutional support that influence students' learning processes (Mahbubah & Darmawan, 2026). According to Sukmadinata (2009), the school environment encompasses the physical, social, and academic environments that directly influence the comfort

and effectiveness of the learning process. Fraser (2012), in a study of the classroom learning environment, explains that the quality of interactions, teacher support, and classroom structure contribute to student engagement and autonomy. Meanwhile, Moos (1973)) argues that a positive educational environment is characterized by social cohesion, personal support, and a focus on achievement. (Jumrawarsi & Neviyarni, 2020) found that a supportive school atmosphere has a significant impact on enhancing learning autonomy among vocational high school students.

A high-quality school environment is reflected not only in the availability of physical facilities, but also in the academic climate, social relationships, and support from educators that enable students to actively participate in the learning process. This environment provides students with opportunities to develop a sense of responsibility and make decisions independently. (Rahmadani et al., 2026).

Sardiman (2011) defines learning motivation as an internal drive within students that makes them willing to initiate, sustain, and direct their learning activities toward their desired goals. Uno (2016) explains that learning motivation encompasses the desire to succeed, the need to acquire knowledge, hopes for the future, and recognition during the learning process. From the perspective of Self-Determination Theory, intrinsic motivation encourages students to learn actively, exploratively, and meaningfully (Ryan & Deci, 2020). Students with high motivation tend to demonstrate perseverance, effective learning

strategies, and greater responsibility for their learning process (Palangda & Suyono, 2025).

Several studies on the influence of the school environment on learning autonomy such as the study by Jumrawarsi & Neviyarni (2020) have found that a conducive school environment has a significant effect on improving learning autonomy among vocational high school students. A conducive school environment significantly enhances learning autonomy among vocational high school students through its interaction with self-efficacy (Ririn et al., 2021). In the context of deep learning, a school environment that provides practical facilities, a culture of reflection, and adequate academic support can strengthen the development of adaptive and professional graduate profiles (Utomo et al., 2025; Haryadi et al., 2024).

Several studies conducted by Pratiwi (2024) indicate that there has been a significant increase in learning autonomy due to learning motivation and support from peers. Sari (2024) found that practice facilities and teacher support contribute to students' sense of responsibility for their learning. These findings are reinforced by the research of Lestari & Siswanto (2024), which states that a combination of internal (motivation) and external (school environment) factors has a significant simultaneous effect on learning autonomy among students at technical vocational high schools. Sojanah & Kencana (2021) demonstrated that learning motivation has a significant influence on learning autonomy. Thus, the synergy between high learning motivation and a conducive school environment is a prerequisite for shaping

graduate profiles within the framework of deep learning.

Based on observations during LANTIP 6 at SMK Negeri 6 Semarang among 11th-grade Culinary Arts students, the results of the observations showed that many students still relied on guidance from the culinary practice teachers at SMKN 6 Semarang while the practical session was underway and during the cooking process, such as asking for confirmation regarding the sequence of cooking steps, ingredient preparation techniques, and the evaluation of the final dish including color and doneness. This situation indicates that students are not yet able to make decisions and evaluate the results of their practical work.

Furthermore, the use of digital technology in learning has not yet fully fostered students' critical thinking processes. Some students tend to rely on Artificial Intelligence (AI) applications to obtain instant answers without going through a process of analysis, exploration, or discussion, resulting in uniform answers among students. This situation leads to a lack of exploratory understanding, which in turn results in similar answers among students. This phenomenon indicates that the use of AI has not yet fully supported deep learning, as some students still use it as a tool to obtain answers rather than as a means to explore concepts and engage in reflection.

In group-based practical activities, the division of tasks is often uneven, so not all students are actively involved in every stage of the cooking process. This results in some students lacking a sense of responsibility and hands-on experience in the practical learning

process. On the other hand, a learning environment that is not yet fully conducive such as limited practical facilities, the shared use of practice rooms with other classes, and group-based practical sessions with limited ingredients means that students' opportunities to engage independently throughout the entire learning process are less than optimal. This situation can affect the development of independent learning in culinary practical instruction.

These observational findings indicate that independent learning in the context of deep learning has not yet developed optimally. Deep learning requires active engagement, reflective skills, and self-regulation on the part of students in managing their learning process. However, various studies indicate that the implementation of learning in schools still faces obstacles in optimally fostering student engagement and self-regulated learning (Held & Mejeh, 2024; Cigdem & Oncu, 2024).

Based on this phenomenon, the integration of the school environment and learning motivation in fostering independent learning within the framework of the deep learning graduate profile has not yet been optimally established, while the culinary industry's demands on graduates who must possess technical skills, an independent attitude, and the ability to adapt quickly are growing ever higher. Therefore, it is crucial to conduct research to evaluate the influence of the School Environment and Motivation on the Learning Autonomy of vocational high school students majoring in Culinary Arts at SMK N 6 Semarang, particularly for 11th-grade students. This study aims to explore the influence of the

school environment and learning motivation both independently and collectively on learning autonomy in the Culinary Arts program at SMK Negeri 6 Semarang. The results of this study are expected to provide a theoretical contribution to the development of research on learning autonomy in vocational high schools, as well as serve as a practical reference for schools, educators, and program administrators in their efforts to improve motivation, the learning environment, and the development of adaptive and professional graduate profiles.

RESEARCH METHODS

This study employs a quantitative, ex post facto approach. The research was conducted among 11th-grade students majoring in culinary arts at SMK Negeri 6 Semarang during the second semester of the 2025/2026 academic year. Based on observations of the LANTIP 6 activities at SMK Negeri 6, the study population consisted of 139 students, while the sample of 103 students was determined using the Slovin formula and proportionate random sampling. The study is explanatory in nature because the independent variables were already established before the research was conducted and were not experimentally manipulated (Sugiyono, 2019). Data collection was conducted using a Likert-scale questionnaire and documentation. The data were analyzed through a series of validity tests, reliability tests, descriptive analysis, classical assumption tests, simple regression, multiple regression, and calculation of the coefficient of determination using SPSS 32 for Windows.

The sample size for this study was determined using the Slovin formula with an error tolerance of 5% ($e = 0.05$), as follows:

$$n = \frac{N}{(1+N \times \alpha^2)} \quad n = \frac{139}{(1+139 \times 0,05^2)} = 103,15 \quad (1)$$

According to Sugiyono (2019), proportionate random sampling is used when the population consists of strata or groups with different numbers of members in proportion to their size. This technique uses the proportion formula:

Table 1. Results of Proportionate Random

Class	Population (N_i)		Sample
XI.1	36	$(36/139) \times$ 103	26,6
XI.2	35	$(35/139) \times$ 103	25,9
XI.3	32	$(32/139) \times$ 103	23,7
XI.4	36	$(36/139) \times$ 103	26,6
Total	139		102,8

The variables used in this study consist of independent variables, namely the School Environment variable (X_1) and the Learning Motivation variable (X_2), and the dependent variable, Learning Independence (Y).

Indicators of the School Environment Variable (X_1) According to Syah (2015,p135), there are two important aspects in the school context: the social environment such as teachers, administrative staff, and classmates and the non-social aspects, which include the school building, location, facilities, regulations, and school hours. However, this study focuses only on social elements, such as interactions with

teachers and peers, as well as non-social elements, such as school facilities and regulations. Referring to Syah (2015, p. 135), there are various factors that influence learning motivation, including:

- a. Internal factors originating from the individual, including attitudes, character, education, experience, and personal ambition.
- b. External factors rooted in the individual's external environment, including the social environment comprising the community, neighbors, friends, family, and classmates, as well as the non-social environment, which encompasses the condition of school buildings, school location, distance between home and school, learning materials, parents' economic status, and others.

According to Uno (2016, p. 23), the indicators of the learning motivation variable (X_2) stem from internal (from within) and external (from outside) drives; however, this study covers only internal factors (perseverance and self-awareness) and external factors (parents and friends outside of school). Based Uno (2016, p. 10), the indicators of Learning Motivation (X_2) can be categorized as follows:

- 1) There is a desire and passion to achieve success,
- 2) There is motivation and a sense of purpose in the learning process,
- 3) There are hopes and dreams for the future,
- 4) The presence of rewards in the learning process,
- 5) There are engaging activities in the learning process,

According to Tirtaraharja & Sulo. (2005), the indicators of the Learning Independence variable (Y) are learning activities that are driven primarily by one's own desire, personal choice, and individual responsibility in the learning process. Meanwhile, this study covers only learning initiative, responsibility, and self-evaluation.

Before the final data collection, the validity of the instrument was tested in two stages: first, an item validity test using Pearson's product-moment correlation; and second, once all items were proven valid and reliability was assessed via Cronbach's Alpha analysis, the test items were administered again to 103 different respondents.

RESULTS RESEARCH AND DISCUSSION

1. Validity Test

Validity tests are used to evaluate the validity of test items. An item is considered valid if the value falls at the 5% significance level. The calculated r value was obtained using the function in SPSS 32 for Windows. Conversely, the table r value was obtained using the Product-Moment correlation table at a 5% significance level and $df = (n - 2)$. The formula used is:

$$r_{xy} = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{[N\sum X^2 - (\sum X)^2][N\sum Y^2 - (\sum Y)^2]}} \quad (2)$$

The Product-Moment correlation coefficient at a 5% significance level, based on 30 participants, was 0.361. The validity assessment indicated that for the School Environment variable (X_1), question number 1 yielded a validity score of 0.297, while for the

Learning Motivation variable (X_2), question number 31 recorded a validity score of 0.347. The results of the validity test show that out of a total of 45 statements, 43 were deemed valid and 2 were determined to be invalid and will therefore not be used in this study. All variables showed values greater than 0.70, meaning the instrument is reliable and suitable for use.

2. Reliability Test

Next, the reliability of all items was analyzed using Cronbach's Alpha with the following formula:

$$\alpha = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum S_i^2}{S_t^2} \right)$$

Table 2. Reliability Test Results

Variable	Cronbach's Alpha	r _{table} (N)	Interpretation
School Environment (X_1)	0,881	>0,70	Reliable
Learning Motivation (X_2)	0,925	>0,70	Reliable
Learning Independence (Y)	0,873	>0,70	Reliable

An instrument is considered reliable and consistent if its Cronbach's Alpha value is ≥ 0.70 . Reliability testing is used to verify that a research instrument is reliable so that it can be used repeatedly with consistent results. As shown in Table 2, the calculation results indicate that all variables under study have a Cronbach's Alpha value of 0.70. Thus, it can be concluded that each variable in the questionnaire used in this study is reliable.

3. Descriptive Analysis

This analysis was conducted to determine the characteristics of each variable reported by respondents based on the collected data. The results were presented using descriptive percentage analysis, with decisions made based on percentage ranges using SPSS 32 for Windows.

The results of the descriptive statistical analysis of the data distribution for the School Environment variable (X_1) show a minimum value of 31, a maximum value of 59, and a mean of 44.94. The standard deviation of the School Environment data (X_1) is 5.432. According to the results of the descriptive statistical analysis, students' perceptions of the school atmosphere tend to fall into the "Fairly Good" category, with 35.0% of participants in this category. Furthermore, 26 respondents fell into the "Good" category, equivalent to 25.2%, and 25 respondents (24.2%) were in the "Not Very Good" category. Meanwhile, 15 respondents (14.6%) were classified in the "Very Good" category, and only 1 respondent (1.0%) fell into the "Very Poor" category. Overall, this indicates that the School Environment (X_1) is considered quite adequate, as the majority of the data is concentrated in the better categories.

Based on the descriptive statistical analysis of the Learning Motivation variable (X_2), the data distribution showed a minimum value of 24 and a maximum value of 57, with a mean Learning Motivation (X_2) of 46.39. The standard deviation for the Learning Motivation (X_2) data was recorded at 6.009. Through a percentage analysis of the Learning Motivation variable (X_2), it was found that the majority of

respondents fell into the “Moderate” category, totaling 32 respondents (31.1%). The “High” category for Learning Motivation (X_2) also accounted for a significant proportion, with 29 respondents (28.2%), followed by the “Very High” category with 28 respondents (27.2%). On the other hand, 10 respondents (9.7%) had a Learning Motivation (X_2) in the “Low” category, and the “Very Low” category consisted of 4 respondents (3.9%). Overall, these data indicate that students’ levels of Learning Motivation (X_2) are in very good condition, as more than 86% of respondents fall into the moderate, high, and very high categories.

The results of the descriptive statistical analysis of the data distribution obtained from the Learning Independence (Y) variable show a minimum value of 25, a maximum value of 45, and a mean Learning Independence (Y) score of 35.35. The standard deviation of the Learning Independence (Y) data is 4.914. Meanwhile, based on the percentage distribution, it can be seen that the respondents’ Learning Independence (Y) levels are mostly in the “High” category, with 35 respondents (34.0%), followed by the “Medium” category with 34 respondents (33.0%). Meanwhile, 15 respondents (14.6%) fell into the “Low” category, 11 respondents (10.7%) into the “Very High” category, and the remaining 8 respondents (7.8%) into the “Very Low” category. Overall, these findings reflect a level of Learning Independence (Y) that is predominantly positive, given that the “Moderate” and “High” categories combined account for more than 67% of the data.

These findings indicate that the respondents’ circumstances are generally

supportive of the learning process, although there is still room for improvement.

4. Classical Assumption Tests

4.1. Normality Test

Based on the analysis presented in Table 3 using the One-Sample Kolmogorov–Smirnov test, the Asymp. Sig. (2-tailed) values were obtained using SPSS 32 for Windows () for all variables, showing a significance value of 0.200. Thus, all variables follow a normal distribution, as their significance values are greater than 0.05. (Ghozali, 2021).

Table 3. Results of the Normality Test (K-S)

One-Sample Kolmogorov-Smirnov Test				
		(X ₁)	(X ₂)	(Y)
	N	103	103	103
Normal Parameters ^{a,b}	Mean	.00000 00	.00000 00	.00000 0
	Std. Deviation	4.0189 9624	4.1411 3984	4.0667 6759
Most Extreme Differences	Absolute	.073	.064	.071
	Positive	.047	.038	.047
	Negative	-.073	-.064	-.071
Test Statistic		.073	.064	.071
Asymp. Sig. (2-tailed) ^c		.200 ^d	.200 ^d	.200 ^{c,d}

4.2. Multicollinearity Test

Based on the calculations in Table 4, which were obtained using SPSS 32.0, the VIF value for Variable (X_1) and Variable (X_2) is $1.580 < 10$, and the tolerance value is $0.633 > 0.10$; therefore, the data satisfy the multicollinearity assumption, meaning there is

no multicollinearity among the independent variables in the regression model (Ghozali, 2021).

Table 4. Results of the Multicollinearity Test

Model		
	Tolerance	VIF
1 (Constant)		
School	.633	1.580
Environment (X ₁)		
Learning	.633	1.580
Motivation (X ₂)		

4.3. Heteroscedasticity Test (Glejser)

Based on the calculations in Table 5 using the SPSS 32 for Windows software and the Glejser method, the significance values are 0.392 and 0.149. Both values are > 0.05 ; therefore, it can be concluded that there is no heteroscedasticity in the regression model. Thus, the regression model satisfies the assumption of homoscedasticity.

Table 5. Results of the Heteroscedasticity Test (Glejser)

	Model	t	Sig
1	(Constant)	-1.024	.308
	School		
	Environment	.860	.392
	(X ₁)		
	Learning	1.455	.149
	Motivation (X ₂)		

4.4. Durbin-Watson Autocorrelation Test

The autocorrelation test aims to determine whether there is a correlation between the residuals of a given observation and the

residuals of the previous observation in a regression model (Ghozali, 2021).

Table 6. Autocorrelation Test Results

Durbin-Watson
2.054

Referring to Table 6 in the Durbin–Watson column, with a sample size of $n = 103$ and $k = 2$ independent variables, the Durbin–Watson (DW) value is 2.054; at a 5% significance level, the upper limit (dU) for the Durbin–Watson table is not listed here; therefore, the interpretation of the presence of autocorrelation must be performed after the dU (and dL) values are obtained from the Durbin–Watson critical table for $n = 103$ and $k = 2$.

1.7186 and the value of $4-dU$ is 2.2814. Since the Durbin–Watson value falls within the range $1.7186 < 2.054 < 2.2814$, it can be concluded that the regression model does not exhibit autocorrelation. Thus, the assumption of no autocorrelation has been satisfied.

5. Hypothesis Testing

5.1. Simple Regression Test

5.1.1. T-test

The results of the t-test analysis can be seen in Table 7, which was processed using SPSS 32 for Windows. The results show that School Environment (X₁) has a significance value of < 0.000 (< 0.05) and a t-value of 8.018, which is greater than the critical t-value of 1.984. Therefore, the School Environment (X₁) has a significant effect on the Learning Independence variable (Y) of 11th-grade students in the Culinary Arts Department at SMK N 6 Semarang; thus, H_{01} is rejected and H_{11} is accepted. Furthermore, the constant term a is

9.097 with a slope of 0.584; thus, when substituted into the equation, the simple regression equation becomes $Y = 9.097 + 0.584x$.

Table 7. Results of the t-Test Calculations

Model	Unstandardized Coefficients	t	Sig.
	B		
(Constant)	9,097	2.760	.007
1 School Environment (X ₁)	.584	8.018	.000
(Constant)	6,787	2,545	.012
1 Learning Motivation (X ₂)	.616	10.794	.000

The results of the t-test for the Learning Motivation variable (X₂) show a significance value of <0.000 (<0.05) and a calculated t-value of $10.794 >$ the table t-value of 1.984, indicating that the Learning Motivation variable (X₂) has a significant effect on the Learning Independence variable (Y) of 11th-grade students in the Culinary Arts Department at SMK N 6 Semarang; thus, H₀₂ is rejected and H₁₂ is accepted. Furthermore, the constant term a has a value of 6.787 with a coefficient of 0.616; thus, when substituted into the simple regression equation, the result is.

5.2. Multiple Regression Test

5.2.1. F-test

The F-test is used to determine the combined effect of independent variables on the dependent variable (Ghozali, 2021).

Based on Table 8 above, it can be seen that the significance values obtained using SPSS 32 for Windows for the effects of School

Environment (X₁) and Learning Motivation (X₂) are $<0.001 < 0.05$, and the calculated f-value of 73.508 is greater than the table f-value of 3.087. This proves that H₀₃ and H₁₃ are accepted, meaning there is a significant simultaneous (combined) effect of School Environment (X₁) and Learning Motivation (X₂) on Learning Independence (Y).

Table 8. Results of the F-Test Calculations

ANOVA				
Model	Sum of Squares	Mean Square	F	Sig.
Regression	1466.144	733.072	73.508	$<.001^b$
Residual	997.273	9.973		
Total	2463.417			

In Table 9, the constant value a obtained is 0.963, and the regression coefficient for the School Environment variable (X₁) shows a positive value of 0.281. The regression coefficient for the Learning Motivation variable (X₂) is positive at 0.469. Therefore, when substituted into the multiple regression equation, $Y = 0.963 + 0.281(X_1) + 0.469(X_2)$.

6. Coefficient of Determination (R²) Test

The coefficient of determination (R²) is used to evaluate the extent to which the independent variable can explain the variation in the dependent variable. The results of the coefficient of determination test shown in Table 10 were calculated using SPSS 32 for Windows.

It is known that the School Environment Variable (X₁) has an Adjusted R-squared value of 0.383, indicating that it contributes 38.3% to the Learning Independence Variable (Y). Meanwhile, the remaining 61.7% is influenced

by other factors not included in this study. On the other hand, the Learning Motivation Variable (X_2) shows an Adjusted R-squared value of 0.531, meaning it contributes 53.1% to the Learning Independence Variable (Y), with the remaining 46.9% influenced by variables outside the scope of this study. Furthermore, the combined Adjusted R-squared value for the School Environment Variable (X_1) and the Learning Motivation Variable (X_2) reached 0.587. This indicates that these two variables collectively account for 58.7% of the Learning Independence Variable (Y), while the remaining 41.3% is influenced by other factors not analyzed in this study.

Table 9. Results of the R^2 Test Calculations

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
(X_1 *Y)	.624 ^a	.389	.383	3.861
(X_2 *Y)	.732 ^a	.536	.531	3.365
(X_1 , X_2 *Y)	.771 ^a	.595	.587	3.158

Discussion

The Effect of the School Environment (X_1) on the Academic Independence (Y) of Culinary Students at SMK N 6 Semarang

Descriptively, the School Environment (X_1) falls into the “fairly good” category, indicating that school conditions generally support the learning process, although they are not yet fully optimal particularly regarding practical learning. These results align with Slameto (2013) view that school factors such as teacher-student relationships, teaching methods,

the availability of learning materials, and the school’s physical conditions influence the learning process and outcomes. In the context of SMK Negeri 6 Semarang, this “fairly good” category can be understood from field findings that practical facilities are still limited, practice rooms are sometimes shared, and group learning does not always provide equal opportunities to all students.

Regression analysis indicates that the school environment has a positive and significant effect on students’ independence in learning. This study shows that improvements in the quality of the school environment go hand in hand with an increase in students’ ability to learn independently. These findings suggest that the better the conditions in the school environment, the greater students’ ability to learn independently. Theoretically, a supportive environment provides students with the space to experiment, discuss, and make their own decisions, so they do not always have to rely on the teacher’s guidance. This is consistent with Fraser (2012), who emphasizes the importance of the quality of interactions, teacher support, and classroom structure in fostering student engagement and independence.

In culinary practice classes, the influence of the school environment becomes increasingly evident because students are required to be meticulous, quick, and accountable for the results of their work. When practical facilities are inadequate or practical opportunities are not evenly distributed, students tend to be more passive and dependent on teachers. Thus, adequate facilities, effective classroom management, and equitable practical

opportunities are crucial to prevent students from becoming overly dependent on teachers and to reinforce the idea that a more conducive school environment will help students develop greater independence in learning.

The Effect of Learning Motivation (X₂) on Learning Independence (Y) Among Culinary Students at SMK N 6 Semarang

The research findings show that learning motivation falls into the moderate to very high categories, indicating that most students already have fairly good learning motivation. However, the predominance of the moderate category suggests that this motivation is not yet evenly distributed and is not yet fully stable among all students. According to Sardiman (2011), learning motivation is a driving force that initiates learning activities and sustains them. Uno (2016) also emphasizes that learning motivation encompasses the desire to succeed, the need to learn, future aspirations, and the rewards of learning.

The results of the regression analysis show that learning motivation has a positive and significant impact on learning autonomy. This means that the higher a student's learning motivation, the greater their level of autonomy in managing their learning process. These findings support the assertion by Ryan & Deci (2017) in their Self-Determination Theory, which states that intrinsic motivation develops when the needs for autonomy, competence, and relatedness are met. Students with strong motivation tend to be more persistent, more proactive in seeking information, and better able to independently plan their learning strategies.

In the context of deep learning, learning motivation is crucial because students are expected not only to obtain answers but also to understand the processes behind those answers. Field findings indicating that some students use AI for instant answers suggest that learning motivation has not yet been fully directed toward reflective thinking and exploratory. Therefore, efforts to strengthen learning motivation should be directed so that students are not only active in terms of outcomes but also active in the learning process itself.

The Simultaneous Effect of the School Environment (X₁) and Learning Motivation (X₂) on Learning Independence (Y) Among Culinary Students at SMK N 6 Semarang

In percentage terms, students' levels of learning autonomy show a positive trend, as the majority of respondents fall into the moderate and high categories. The results of the F-test indicate that the School Environment (X₁) and Learning Motivation (X₂) work together to have a significant impact on Learning Autonomy (Y). These findings reveal that learning autonomy is shaped by a combination of external support and internal motivation. In other words, a supportive school environment must be balanced with strong learning motivation so that students can develop greater autonomy.

The high value of the adjusted R² indicates that more than half of the variation in learning autonomy can be explained by the combined effects of the school environment and learning motivation. This suggests that these two variables are the primary factors shaping students' learning autonomy in the context of vocational education, although there are other

factors such as self-efficacy, family support, and digital literacy that were not analyzed in this study.

These findings are consistent with Zimmerman (2000) view that self-regulated learning encompasses students' skills in designing, monitoring, and evaluating their own learning processes. This view is further supported by Bandura et al. (1999) and Schunk & Greene (2017), who emphasize the importance of the interaction between the individual and the environment in shaping learning behavior. Thus, when the school environment is supportive and students' motivation to learn is strong, students will be better able to learn independently, responsibly, and reflectively.

In the context of 11th-grade students in the Culinary Arts program at SMK Negeri 6 Semarang, these results indicate that improvements in independent learning must be implemented in an integrated manner. The school needs to improve facilities and the practical learning environment, while teachers need to foster student motivation through learning experiences that are more challenging, meaningful, and encourage active participation. These findings underscore that deep learning can only be achieved when environmental support and student motivation go hand in hand.

CONCLUSIONS AND SUGGESTIONS

Conclusion

The results of this study indicate that students' learning autonomy in deep learning at vocational high schools does not develop in isolation but rather results from the interaction

between the school environment and learning motivation. These findings confirm that a conducive school environment and strong motivation to learn are both essential foundations for developing students who can independently manage, monitor, and evaluate their own learning processes.

In theory, this study supports the argument that freedom in learning is influenced by a combination of internal and external factors, not solely by individual ability. In the context of vocational education, this suggests that efforts to foster independent learners should focus not only on strengthening personal motivation but also on creating a learning environment that provides space for initiative, responsibility, and self-reflection.

Consequently, improving the quality of learning in vocational high schools should be carried out in an integrated manner through improvements to practical facilities, the management of the learning environment, and teaching strategies that foster students' intrinsic motivation. Thus, the results of this study not only address the issue of the influence of the school environment and learning motivation on independent learning but also provide a conceptual foundation for the idea that fostering independent students requires synergy between the school system and the students' personal readiness.

For future research, the study could be expanded to include other variables that may influence learning autonomy, such as self-efficacy, family support, digital literacy, or teachers' instructional strategies. Future research could also employ a mixed-methods approach or

expand the sample area to provide a more comprehensive picture of learning autonomy among vocational students.

Suggestion

Based on the findings of this study, schools are advised to strengthen a conducive learning environment, particularly by improving practical facilities, organizing learning spaces more effectively, and providing equal opportunities for students to actively engage in every stage of the learning process. These steps are important so that students become more accustomed to making decisions, taking responsibility, and managing their learning process independently.

Teachers are advised to design lessons that better encourage student initiative and reflection, for example through hands-on assignments that require problem-solving, evaluation of work, and critical discussion. In this way, learning focuses not only on the final outcome but also on the process of developing students' independence in learning.

Students are advised to get into the habit of setting learning goals, monitoring their learning progress, and regularly evaluating their work. Digital technology, including AI, should be used as a tool to help them understand the material, not as a quick fix to get answers without thinking.

Future researchers are advised to include additional variables related to independent learning, such as self-efficacy, family support, interest in learning, and digital literacy. Future studies may also employ a more diverse sample or different approaches so that the research results provide a more comprehensive picture of

the factors influencing independent learning among vocational students.

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