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International Journal of Information Technology and Education (IJITE) 5 (3), (June 2026) 240 - 255

International Journal of Information Technology and Education (IJITE)

http://ijite.jredu.id

Analysis of Learning Commitment and Learning Discipline with Student Learning Achievement at State Vocational School 1 Tomohon

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ARTICLE INFO
Article history:
Received: April 11, 2026; Received in revised form: May 13, 2026; Accepted: May 29, 2026;
Available online: June 01, 2026;

ABSTRACT

This study aims to analyze the influence of learning commitment and learning discipline on student achievement at SMK Negeri 1 Tomohon in the context of vocational education. The study uses a quantitative approach with a correlational design through regression analysis to test the causal relationship between variables. The research variables consist of learning commitment and learning discipline as independent variables, and student learning achievement as the dependent variable. Data were collected using a Likert scale questionnaire that has been tested for validity and reliability, while learning achievement data were obtained through documentation of student academic grades. Data analysis was carried out using descriptive and inferential statistics through normality tests, linearity tests, regression significance tests, and path coefficient analysis. The results showed that learning commitment has a direct positive and significant effect on student learning achievement with a path coefficient value of $\rho y1 = 0.265$ and tcount = 2.039 > ttable = 1.66 at a significance level of $\alpha = 0.05$. In addition, learning discipline was also proven to have a positive and more dominant direct influence on student learning achievement with a path coefficient value of $\rho y2 = 0.491$ and thitung = 7.290 > ttabel = 1.66. These findings indicate that the improvement in learning achievement of vocational high school students is not only influenced by academic ability, but also by learning engagement, behavioral consistency, self-control, and adherence to the learning process. In the context of technical and vocational education, learning commitment and learning discipline are strategic factors in shaping work readiness, professional responsibility, and the quality of graduates who are adaptive to the needs of the industrial world. This study provides theoretical contributions to the development of vocational education studies as well as practical implications for strengthening learning culture and character-based learning strategies in vocational high schools.

Keywords: learning achievement, learning commitment, learning discipline, vocational education, vocational high school students.

INTRODUCTION

Education is the most important capital for a nation. Therefore, the role of higher education is essential in the process and dynamics of sustainable development. SMK Negeri 1 Tomohon is a public school in Tomohon City, North Sulawesi Province. One of SMK Negeri 1 Tomohon's missions is to provide quality education, encompassing input, process, and output, that is competitive and relevant to community needs. The pursuit of this mission is not easy, as reflected in the concerning academic performance of students.

In an educational institution, academic achievement is a crucial indicator for measuring the success of the teaching and learning process. However, it cannot be denied that student achievement is heavily influenced by both internal and external factors. Numerous studies indicate that many students fail to complete their education within the minimum timeframe, or even fail to complete their studies altogether. One of the goals of the learning process is to achieve academic achievement. Hamdani (2011) states that academic achievement is the result of impressions that lead to changes in an individual as a result of learning activities. This academic achievement reflects the success of efforts to optimize one's abilities in participating in the subject. However, in reality, students are still generally unable to fully develop their potential as expected.

Addressing this issue in education, academic achievement is crucial to supporting student success. Learning outcomes are one of the goals of learning and also serve as a motivator for one's activities. In an educational institution, academic achievement is a crucial indicator for measuring the success of the teaching and learning process. However, it cannot be denied that student achievement is influenced by factors other than the teaching process itself.

Based on data from SMK Negeri 1 Tomohon regarding learning achievement in engineering subjects, it remains unsatisfactory or suboptimal. In reality, some students still score below the Minimum Competency (KKM). Every student is unique; these individual differences contribute to differences in learning behavior among students, thus contributing to differences in learning achievement. Learning achievement is the result of a process involving a number of interconnected factors; the level of student achievement depends on these factors. From a modern educational psychology perspective, student motivation and engagement in learning are fundamental factors determining the quality of learning outcomes. Brophy (2010) explains that students with a positive learning orientation and high intrinsic motivation tend to demonstrate better academic engagement, which directly impacts learning achievement.

Low learning achievement can be caused by a variety of factors, both internal and external. The factors causing low learning achievement are classified into two groups: internal factors originating from within the student and external factors originating from outside the student (Slameto, 2010). Internal factors are influenced by physical health and disabilities, as well as psychological factors such as intelligence, discipline, attention, interest, talent, motive, commitment, maturity, and readiness. External factors are influenced by family, school, and community factors.

Seeing the facts on the ground, teachers have attempted to find solutions and approach students themselves by providing an understanding of their future if they do not change their behavior for the better. Academic achievement is important, because by knowing the results achieved, students will strive to improve their academic performance. Low engineering academic

achievement indicates that something is not right and that the learning process is not optimal. Factors causing low engineering academic achievement include a perceived low commitment to learning and discipline. Commitment is an action taken to support a particular course of action, so that the chosen course of action can be carried out firmly and wholeheartedly. For example, commitment to interests for needs is an agreement to complete something because of the interests of the need. Commitment exists when humans have the opportunity to determine what to do. Commitment is a combination of persistence and consistency and must be based on high perseverance and a strong heart to continue doing it continuously (Resa, 2010). This means that if someone is committed, they must have the determination or desire to diligently and consistently carry out whatever they set out to do, according to their expertise, without being influenced by others or small obstacles. Commitment is action, both in difficult and easy times. Integrity and wisdom are two pillars that support commitment. Integrity and wisdom emerge from a person's convictions, formed through strong and strong personal values. Despite pressure, these convictions are difficult to change and actually grow stronger.

In addition to commitment to learning, discipline in learning can influence student achievement. Regarding student achievement, discipline in learning plays a significant role. Discipline in learning is a crucial aspect of student personality. Prasojo's (2014) research explains the significant influence of discipline in learning on academic achievement. For academics, including students, discipline in learning is an absolute prerequisite for achieving high academic achievement. Discipline in learning is necessary to build a strong and resilient character. Discipline in learning is necessary to continually discover the best within oneself. Discipline in learning is necessary to foster a high spirit for life. Learning discipline to focus on what you desire and dream of. Learning discipline is a good start to creating a reliable self and high learning outcomes. Students can develop high problem-solving skills if they are grounded in strong learning discipline. The need for academic achievement is a driving force and motivates students' enthusiasm for learning, encouraging them to develop their creativity and direct all their potential and energy towards achieving optimal learning outcomes.

This research problem can be focused on the relationship and influence between learning commitment and learning discipline on student learning achievement. More operationally, this research problem can be detailed as follows: (1) what is the level of learning commitment of students at SMK Negeri 1 Tomohon in the learning process; (2) what is the level of student learning discipline in participating in academic activities; and (3) what is the level of student learning achievement as an output of vocational education. This formulation is important because learning commitment not only reflects students' internal attitudes towards the learning process but also functions as a mediator that strengthens academic achievement through active involvement in learning. Furthermore, this research is also directed at answering the causal relationship between variables, namely: (4) whether there is a significant influence of learning commitment on student learning achievement; (5) whether there is a significant influence of learning discipline on student learning achievement; and (6) whether learning commitment and learning discipline simultaneously influence student learning achievement. This question is based on empirical findings that learning discipline contributes significantly to the academic achievement of vocational school students, both partially and simultaneously with other variables. In addition, learning commitment has also been shown to have a direct influence on improving academic performance through increased involvement and positive attitudes towards learning. Furthermore, from the perspective of technical and vocational education, this problem formulation is strategic because the characteristics of learning in vocational schools require a balance between cognitive, affective, and psychomotor aspects. Therefore, this study also seeks to answer: (7) which variable most dominantly influences

student learning achievement, between learning commitment or learning discipline. This is important for formulating appropriate pedagogical interventions to improve the quality of vocational school graduates who are ready to work. Thus, the overall formulation of this problem is not only descriptive and correlational, but also leads to in-depth inferential analysis in order to produce evidence-based recommendations (evidence-based practice) in the field of building engineering education.

State-of-the-art research on learning commitment, learning discipline, and learning achievement shows a growing trend toward integrating psychological, behavioral, and structural analysis approaches to explain student academic achievement, including in the context of vocational education. Learning achievement is no longer understood as a purely linear outcome, but rather as the result of a complex interaction between internal factors (motivation, commitment, self-efficacy) and behavioral factors such as learning discipline. In structural equation modeling-based studies, learning commitment has been shown to play a significant role as a mediating variable linking psychological factors to learning outcomes, thereby strengthening student academic engagement and success. This suggests that learning commitment functions not only as an attitude but also as a driving construct in modern learning systems.

Furthermore, learning discipline in recent studies has shifted from simply adherence to rules to a broader construct, encompassing self-discipline, time management, and consistent learning behavior. Research in reputable journals indicates that self-discipline plays a significant mediating role between cognitive ability and academic achievement, strengthening the argument that behavioral factors contribute substantially to learning achievement. In fact, in contemporary educational psychology models, learning discipline is positioned as a behavioral regulator that optimizes the learning process through effective management of learning strategies.

Research developments also indicate a trend toward variable integration, where learning commitment and learning discipline are no longer analyzed separately but rather in a simultaneous or mediating model. Recent empirical studies confirm that learning discipline can function as a mediating variable, strengthening the influence of motivation on academic achievement. Furthermore, a multivariate approach shows that the combination of learning discipline and other variables can explain a significant proportion of the variance in learning achievement, even reaching over 30% in the context of vocational education. This confirms that learning discipline plays a strategic role in improving the quality of practice-based learning outcomes for vocational high school students.

However, there is a clear research gap. Most research still focuses on general or higher education contexts, while specific studies on technical and vocational education, particularly in vocational high schools (SMK) in Indonesia, are still limited. Furthermore, the integration of learning commitment and learning discipline within a comprehensive analytical model within the local context has not been explored in depth. In fact, the characteristics of learning in vocational schools, including in the field of building engineering, have unique demands in the form of a balance between cognitive, affective and psychomotor aspects, so that a more contextual approach is required.

Thus, the state-of-the-art position of this research lies in its effort to integrate two key constructs: learning commitment and learning discipline, within a single empirical analytical framework specific to the context of SMK Negeri 1 Tomohon. This research not only tests direct relationships but also has the potential to develop simultaneous or even mediation models relevant to the characteristics of vocational education. Its novel contribution lies in the local context, the integration of variables, and the analytical approach, which can generate practical, evidence-based recommendations for improving the quality of learning in building engineering education.

The problem-solving approach in this applied research needs to be systematically designed, based on empirical evidence, and relevant to the characteristics of vocational education, particularly in the field of building engineering at vocational high schools. Conceptually, the main problem faced is suboptimal student achievement, which is suspected to be influenced by low learning commitment and learning discipline. Therefore, the approach used is not merely descriptive but must integrate a quantitative, explanatory approach capable of measurably testing causal relationships between variables. This approach aligns with developments in educational research that use inferential statistical models such as multiple regression or structural equation modeling to explain the contribution of psychological and behavioral variables to learning achievement.

The first step in this problem-solving approach is to conduct a diagnostic assessment of the student's actual condition. This is done by measuring the level of learning commitment, learning discipline, and learning achievement using valid and reliable instruments. Learning commitment is measured through indicators of engagement, persistence, and academic responsibility, while learning discipline is measured through adherence to learning rules, time management, and consistency in completing assignments. This approach is supported by research showing that learning discipline contributes significantly to academic achievement, even explaining more than 30% of the variation in student learning outcomes. Therefore, the diagnostic stage provides an important foundation for understanding the initial patterns of relationships between variables.

The second step is developing an analytical model for the relationships between variables. In this context, the problem-solving approach is directed at examining the direct and simultaneous effects of learning commitment and learning discipline on academic achievement. Furthermore, a more sophisticated approach could consider the role of mediating variables, where learning discipline serves as a mediator between internal factors such as motivation or commitment and academic achievement. Empirical findings indicate that without strong discipline, high commitment or motivation does not always result in optimal learning achievement. Therefore, the analytical model used must be able to comprehensively capture the dynamics of this relationship.

The third step is implementing interventions based on the analysis results. In applied research, problem-solving does not stop at hypothesis testing but continues with the formulation of strategies to improve the quality of learning. Interventions can include strengthening a culture of learning discipline through structured classroom management, implementing project-based learning that increases student commitment, and integrating a monitoring system based on periodic evaluations. This aligns with research findings confirming that the combination of learning discipline and other internal factors simultaneously has a significant influence on vocational high school student achievement. Therefore, the interventions designed must be integrative, not partial.

The fourth step is continuous evaluation and feedback (continuous improvement). This approach involves comparing pre- and post-intervention results to determine the effectiveness of the strategies implemented. Evaluation is conducted quantitatively through analysis of academic grade improvement and qualitatively through observation of changes in student learning behavior. This approach is important because in structural engineering education, learning success is measured not only by cognitive aspects but also by the consistency of students' practices and professional attitudes.

The novelty of this research lies, firstly, in the integration of two main constructs, namely learning commitment and learning discipline, into a single comprehensive analytical model. Previous research has tended to examine learning discipline as a single variable or as a mediator of motivation on learning achievement. In fact, in studies based on structural equation modeling, learning discipline has been shown to be an important mediator between cognitive ability and academic achievement. However, few studies have simultaneously examined the direct and

combined interactions between learning commitment and learning discipline on learning achievement within a single integrated analytical framework. Thus, this study offers a new contribution in the form of an integrative model that combines psychological dimensions (commitment) and behavioral dimensions (discipline). Secondly, the novelty lies in the specific research context, namely building engineering education in vocational high schools. Most previous research has been conducted in general education contexts or non-engineering fields, thus paying less attention to the unique characteristics of vocational learning, which demands a balance between cognitive, affective, and psychomotor aspects. In fact, in building engineering education, learning discipline is not only related to academic compliance but also relates to work standards, safety, and accuracy in practice. Empirical studies show that learning discipline significantly contributes to vocational high school students' learning achievement, and can even simultaneously explain a significant proportion of the variance in learning outcomes. However, its integration with the variable of learning commitment in a vocational context remains underexplored. The third novelty is the analytical approach that has the potential to develop more complex relationship models, such as simultaneous influences and the identification of dominant variables. This research goes beyond simple correlational relationships, but is directed at examining the strength of each variable's influence and its relative contribution to learning achievement. This is important because in educational practice, effective interventions must be based on the variables that most dominantly influence learning outcomes. Furthermore, this research opens up opportunities for the development of mediation or moderation models based on local contexts, which have so far been dominated by studies in global contexts. The fourth, practical novelty, is the research's orientation toward applicable solutions to improve the quality of learning at SMK Negeri 1 Tomohon. This research not only produces theoretical findings but is also designed to provide evidence-based recommendations that can be directly implemented by teachers and education administrators. By identifying the relationship between learning commitment, learning discipline, and learning achievement, this research can serve as a basis for designing more effective learning strategies, such as strengthening a culture of discipline, increasing student engagement, and developing practice-based learning models. Overall, the novelty of this research lies in the integration of variables, the specific vocational context, the comprehensive analytical approach, and the strong application orientation. This position makes the research not only academically relevant but also has a real contribution to the development of building engineering education at the vocational high school level.

METHOD

Research Type and Design

This research is quantitative. The research design used is correlational, which means investigating relationships, using regression analysis techniques. See Figure 1.

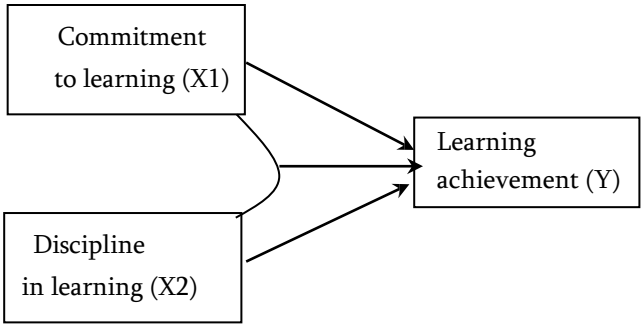

Figure 1. Research Design

Research Population and Sample

The population in this study was all students of SMK Negeri 1 Tomohon. The sample size was determined later.

Research Variables and Instruments

This study measured three variables: two exogenous variables as independent variables (causes): learning commitment (X1) and learning discipline (X2), and the endogenous variable (caused), namely student achievement (Y). The research instrument for the dependent variable used a Likert-scale questionnaire with five options (5, 4, 3, 2, 1). The questionnaire was developed by the researcher based on the theories used. The questionnaire was distributed to the students who participated in this study. The instrument was then tested for validity (accuracy) and reliability (data consistency). For the student achievement variable (Y), the engineering GPA was taken.

The data collection technique in this study used a questionnaire. A questionnaire is a data collection technique that involves providing respondents with a set of written questions or statements to answer. Questionnaires are an efficient data collection technique, used when the number of respondents is large and spread across a wide area.

Research Data Analysis

The data obtained will be analyzed using descriptive and inferential analysis. Descriptive analysis is used to present data, measure central tendency, and measure dispersion. Data presentations are presented in the form of distribution charts and histograms. The measures central tendency are the mean, median, and mode, while the measures of dispersion are the variance and standard deviation.

To meet the requirements of the research instrument, the instrument must first be checked to ensure it aligns with the indicators of each variable and the aspects to be measured. The instrument was then piloted on 30 respondents who were not part of the sample.

Inferential analysis is used to test the hypothesis using statistical regression analysis methods, preceded by normality tests, significance tests for the regression coefficients, and linearity. Next, the influence between the independent and dependent variables is calculated. The influence is reflected in the magnitude of the regression coefficient (using the "F" significance test). For quantitative research, this data analysis technique involves calculations to answer the problem formulation and test the hypothesis (Riduwan, 2011).

When using parametric analysis, analysis requirements testing must be performed against assumptions such as data normality and linearity using SPSS version 22. Regarding instrument

validity testing, Arikunto (in Riduwan, 2011) explains that validity is "a measure that indicates the level of reliability or validity of a measuring instrument." Furthermore, Sugiyono (2010) explains that "a valid instrument means the measuring tool used to obtain data (measure) is valid." Validity means the instrument can be used to measure what it is supposed to measure (accuracy).

Instrument reliability testing can be conducted externally or internally. External testing can be done using test-resert (stability), equivalent testing, or a combination of the two. "Internally, instrument reliability can be tested by analyzing the consistency of the instrument's items using certain techniques" (Sugiyono, 2010). Furthermore, Riduwan (2011) explains that instrument reliability testing can be conducted in various ways, including: "split-half" and Spearman-Brown, Kuder-Richardson (KR-20), KR-21, ANOVA, Hoyt, and Cronbach's Alpha."

By using valid and reliable instruments for data collection, research results are expected to be valid and reliable. After the data is obtained and tabulated, validity and reliability testing are conducted using factor analysis, namely by correlating instrument item scores using the Pearson Product Moment correlation method and the Cronbach's Alpha method.

RESULTS AND DISCUSSION

Student Achievement Data

Student achievement data collected through student documents based on final grades for the odd semester, with scores ranging between 58 and 84.

Data analysis revealed an average score of 70.81, a standard deviation of 6.758, a median of 71, and a mode of 66. The number of classes is 7 and the length of classes is 4. The results of the data processing are displayed in the following frequency distribution table. See Table 1.

Table 1. Frequency Distribution of Student Learning Achievement Scores

Number	Class Interval	Absolute Frequency	Relative Frequency (%)	Cumulative Frequency (%)
1	58 - 61	8	8.00	8.00
2	62 - 65	11	11.00	19.00
3	66 - 69	20	20.00	39.00
4	70 - 73	29	29.00	68.00
5	74 - 77	13	13.00	81.00
6	78 - 81	11	11.00	92.00
7	82 - 85	8	8.00	100.00
Total		100	100	

Based on the mean value of 70.81, which is in the 70-71 interval class, it can be seen that 29 respondents (29.00%) had student achievement scores equal to the average, 39 respondents (39%) were below the average, and 32 respondents (32%) were above the average. The histogram of this variable can be seen in Figure 2.

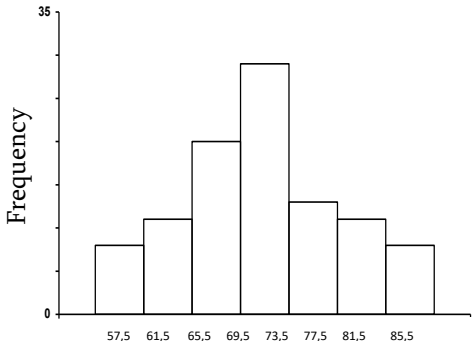

Figure 2. Histogram of Student Learning Achievement

Student Learning Commitment Data

Based on learning commitment data collected through a questionnaire containing 28 statements on a scale of 1–5, the theoretical range is between 28–140. The responses ranged from 102–135, with a range of 33.

Data analysis yielded an average score of 120.09, a standard deviation of 8.627, a median of 121, and a mode of 121. The number of classes is 7 and the length of classes is 5. The results of the data processing are displayed in the following frequency distribution table.

Table 2. Frequency Distribution of Learning Commitment Scores

Number	Class Interval	Absolute Frequency	Relative Frequency (%)	Cumulative Frequency (%)
1	102 - 106	9	9.00	9.00
2	107 - 111	11	11.00	20.00
3	112 - 116	17	17.00	37.00
4	117 - 121	18	18.00	55.00
5	122 - 126	21	21.00	76.00
6	127 - 131	15	15.00	91.00
7	132 - 136	9	9.00	100.00
Total		100	100	

Based on the mean value of 120.09, which is in the interval class 117-121, it can be seen that 18 respondents (18%) have a learning commitment score equal to the average, 37 respondents (37%) are below the average, and 45 respondents (45%) are above the average. The histogram of this variable can be seen in Figure 3 below.

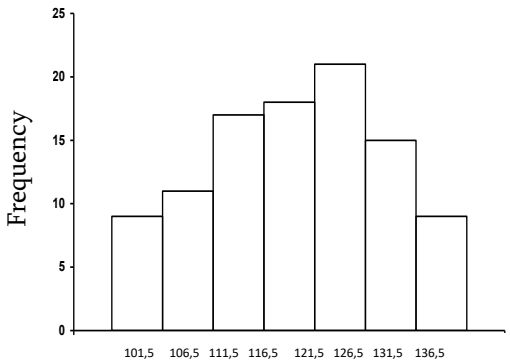

Figure 3. Histogram of Learning Commitment

Student Learning Discipline

Data on student learning independence was collected through a questionnaire containing 28 statements on a scale of 1–5, indicating a theoretical range of 28–140. The responses ranged from 109–135, with a range of 26.

Data analysis yielded an average score of 122.17, a standard deviation of 6.877, a median of 123, and a mode of 125. The number of classes was 7 and the length of the classes was 5. The results of the data processing are displayed in the following frequency distribution table. See table 3.

Table 3. Frequency Distribution of Student Learning Discipline Scores

Number	Class Interval	Absolute Frequency	Relative Frequency (%)	Cumulative Frequency (%)
1	109 - 112	11	11.00	11.00
2	113 - 116	11	11.00	22.00
3	117 - 120	18	18.00	40.00
4	121 - 124	20	20.00	60.00
5	125 - 128	21	21.00	81.00
6	129 - 132	11	11.00	92.00
7	133 - 136	8	8.00	100.00
Total		100	100	

Based on the mean value of 122.17, which is in the interval class 121-124, it can be seen that 20 respondents (20%) have leadership equal to the average, 40 respondents (40%) are below the average, and 40 respondents (40%) are above the average. The histogram of this variable can be seen in Figure 4.

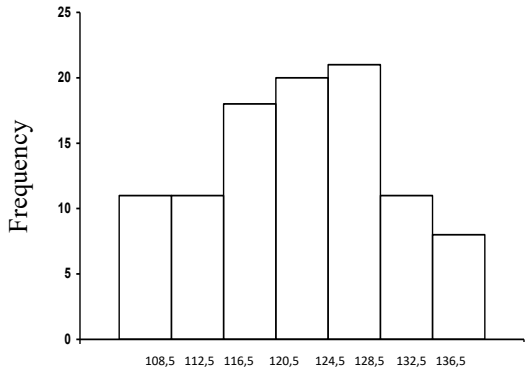

Figure 4. Histogram of Student Learning Discipline

Linearity and Significance Test of the Regression Equation Between X1 and Y

The regression test calculation on the student learning achievement variable data on student learning commitment yielded a regression direction of 0.445 and a constant of 17.335. Thus, the relationship between the two variables can be described by the regression equation $\hat{Y}$ = 17.335 + 0.445X1.

Table 4. Results of the Regression Equation Significance Test Analysis

$$\hat{Y} = 17{,}335 + 0{,}445X_1$$

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1393.191	1	1393.191	43.646	.000[a]
	Residual	3128.199	98	31.920		
	Total	4521.390	99			

a. Predictors: (Constant), X1

b. Dependent Variable: Y

Based on the results of the significance and linearity tests presented in Table 4, the calculated F-value is 43.646, while the F-value for the table with a numerator df of 1 and a denominator df of 98 at a significance level of 0.01 is 6.96. The calculated F-value is greater than the F-value for the table. Therefore, it can be concluded that the regression coefficient of Y on X1 is "very significant" at the 0.01 level, as shown in Table 4.

Furthermore, the results of the linearity test, shown in Table 5, show a calculated F-value of 0.92, less than the F-value of 1.62. This means that the regression equation between learning commitment and student achievement (Y = 17.335 + 0.445X1) is linear.

Table 5. Results of the Linearity Test Analysis of the Regression Equation
$\hat{Y} = 17{,}335 + 0{,}445X_3$

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Y * X1	Between Groups	(Combined)	2299.009	31	74.16	2.26	.003
		Linearity	1393.191	1	1393.19	42.62	.000
		Deviation from Linearity	905.818	30	30.19	.92	.584
	Within Groups		2222.381	68	32.68		
	Total		4521.390	99			

Linearity and Significance Test of the Regression Equation Between X2 and Y

The regression test calculation on the student learning achievement variable data for independent learning yielded a regression direction of 0.717 and a constant of -16.738. Thus, the relationship between the two variables can be described by the regression equation $\hat{Y}$ = -16.738 + 0.717X2

Table 6. Results of the Regression Equation Significance Test Analysis
$\hat{Y} = -16{,}738 + 0{,}717X_2$

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2404.379	1	2404.379	111.303	.000[a]
	Residual	2117.011	98	21.602		
	Total	4521.390	99			

a. Predictors: (Constant), X2

b. Dependent Variable: Y

Based on the significance and linearity test results shown in Table 6, the calculated F-value is 111.303, while the F-value for the table with a numerator df of 1 and a denominator df of 98 at a significance level of 0.01 is 6.96. This means that the calculated F-value is greater than the F-value for the table. Therefore, it can be concluded that the regression coefficient of Y on X2 is "very significant" at a significance level of 0.01.

Furthermore, the linearity test results presented in Table 7 show that the calculated F-value is 1.29, which is less than the F-value of 2.07. This means that the regression equation between learning discipline and student achievement (Y = -16.738 + 0.717X4) is linear.

Table 7. Results of the Linearity Test Analysis of the Regression Equation

$\hat{Y} = -16{,}738 + 0{,}717X_2$

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Y * X4	Between Groups	(Combined)	3055.764	26	117.529	5.85	.000
		Linearity	2404.379	1	2404.379	119.75	.000
		Deviation from Linearity	651.385	25	26.055	1.29	.195
	Within Groups		1465.626	73	20.077		
	Total		4521.390	99			

Hypothesis Test: Learning Commitment Has a Direct Positive Influence on Student Achievement

The hypothesis states that "learning commitment (X1) has a direct positive influence on student achievement (Y)."

$H_0 : \beta_{y1} = 0$

$H_1 : \beta_{y1} > 0$

The path coefficient calculation for the hypothesized causal model yielded a path coefficient of $\rho y3 = 0.143$ with a calculated t of 2.039 and a table of 1.66 at $\alpha = 0.05$. Because the calculated t value is greater than the table of t, the path coefficient is significant, and H0 is rejected. This means that the first hypothesis is confirmed: that the learning commitment variable has a direct positive effect on student achievement.

The results of the hypothesis testing support a positive direct effect of learning commitment on student achievement. This means that high or low learning commitment directly influences high or low student achievement. The higher the learning commitment, the higher the student achievement. Conversely, the lower the learning commitment, the lower the student achievement.

The path coefficient calculated was $\rho y1 = 0.265$. This hypothesis was tested using the t-test statistic. If the calculated t value is greater than the table of t, then H0 is rejected and H1 is accepted. The calculation results show that the t-value is 2.039 at a significance level of $\alpha = 0.01$ with dk = 99. This finding implies that student learning achievement can be directly improved through learning commitment.

The results of the hypothesis test indicate that learning commitment has a direct, positive and significant influence on student learning achievement at SMK Negeri 1 Tomohon. This finding is evidenced by the path coefficient value of $\rho y1 = 0.265$, with a t-value of 2.039, which is greater than the t-value of 1.66 at a significance level of $\alpha = 0.05$. These results confirm that the higher a student's learning commitment, the higher their learning achievement. Conversely, low learning commitment implies low student academic achievement. In the context of vocational education, learning commitment is a strategic factor because learning in vocational schools requires not only mastery of cognitive aspects but also consistency of attitude, active involvement, and responsibility in vocational practice. Students with a strong commitment to learning tend to demonstrate persistence in completing assignments, have a clear goal orientation, and are able to maintain motivation to learn despite facing academic difficulties. This condition reinforces the view that commitment to learning is part of psychological engagement that directly contributes to students' academic success.

The findings of this study align with the theory of self-regulated learning, which explains that students with a high level of commitment are better able to manage their learning process independently, set academic targets, and control their learning behavior to achieve optimal results. According to Barry J. Zimmerman, learning success is strongly influenced by students' ability to set goals, monitor progress, and maintain ongoing learning engagement. Furthermore, learning commitment is also closely related to student engagement, which is a student's emotional and academic attachment to learning activities. Research conducted by John A. Fredricks, Phyllis C. Blumenfeld, and Alison H. Paris shows that student engagement in learning is strongly linked to increased academic achievement, intrinsic motivation, and long-term educational success. Thus, learning commitment not only serves as an internal driver but also serves as a psychological mechanism that strengthens the quality of students' learning processes in vocational environments.

From the perspective of engineering and vocational education, the results of this study have important implications because the characteristics of learning in vocational high schools (SMK) demand a higher level of commitment than in general education. Practice-based learning in the field of structural engineering requires consistency, precision, discipline, and student readiness to continuously complete projects and practical assignments. Therefore, students with a strong commitment to learning tend to be better prepared to face the demands of the working world because they are accustomed to maintaining the quality of their learning process and academic responsibilities. This finding also supports the results of previous empirical research which stated that commitment to learning contributes to increased academic achievement by increasing student engagement and resilience in completing complex academic tasks. Therefore, improving student achievement at SMK Negeri 1 Tomohon can be achieved not only through improving learning methods, but also by strengthening student commitment to learning through motivational coaching, academic mentoring, project-based learning, and developing a positive learning culture oriented towards achieving vocational competencies.

Hypothesis Test: Student learning discipline has a direct, positive effect on student achievement

The hypothesis states that "student learning independence (X2) has a direct, positive effect on student achievement (Y).

$H_0 : \beta_{y2} = 0$

$H_1 : \beta_{y2} > 0$

The path coefficient calculation for the hypothesized causal model yielded a path coefficient of $\rho y4 = 0.491$ with a calculated t of 7.290 and a table of 1.66 at $\alpha = 0.05$. Because the calculated t value is greater than the table value, the path coefficient is significant, and H0 is rejected. This means that the second hypothesis is proven: that student learning independence has a direct positive effect on student achievement.

The results of the hypothesis testing support a positive direct effect of student learning independence on student achievement. This means that high or low student learning independence directly influences high or low student achievement. The higher the student learning independence, the higher the student achievement. Conversely, the lower the student learning independence, the lower the student achievement.

The path coefficient calculated was $\rho y2 = 0.491$. This hypothesis was tested using the t-test statistic. If the calculated t value is greater than the table value, Ho is rejected and H1 is accepted. The calculation results show that the calculated t value is 7.290 at a significance level of $\alpha = 0.01$ with dk = 99. This finding implies that student learning achievement can be directly improved through student learning discipline.

The results of the hypothesis test indicate that learning discipline has a direct, positive and significant influence on student learning achievement at SMK Negeri 1 Tomohon. This finding is evidenced by the path coefficient value of $\rho y2 = 0.491$, with a calculated t value of 7.290, which is greater than the t table value of 1.66 at a significance level of $\alpha = 0.05$. This coefficient value indicates that learning discipline contributes strongly to improving student learning achievement. In the context of vocational education, learning discipline is a key determinant of academic success because the characteristics of learning in vocational schools require regularity, consistency, adherence to practical procedures, and the ability to manage study time effectively. Students with high learning discipline tend to be more able to follow the learning process in a structured manner, complete assignments on time, and maintain focus in both practical and theoretical activities. This condition causes students to have better academic readiness, which has an impact on improving learning achievement.

The results of this study align with behavioral learning theory, which positions discipline as a form of self-control that influences students' learning behavior and academic success. From an educational psychology perspective, learning discipline is closely related to a student's ability to regulate behavior, control distractions, and maintain consistency in learning activities. Angela Duckworth explains that academic success is influenced not only by intellectual intelligence but also by grit and self-discipline, which enable students to persist in the long-term learning process. Research conducted by Terrie E. Moffitt and colleagues also shows that self-discipline has a significant relationship with academic achievement, health, and future social success. Thus, learning discipline can be understood as the ability to regulate behavior that enables students to consistently maintain commitment to their academic goals. This view is supported by Tough (2012), who asserted that non-cognitive character traits such as perseverance, responsibility, self-control, and discipline contribute significantly to academic success and individual readiness to face the challenges of the workplace.

These findings also reinforce previous research suggesting that learning discipline has a stronger relationship to academic achievement than intellectual ability alone. In vocational education research, learning discipline is a crucial factor because the vocational high school learning environment demands the implementation of work standards similar to the industrial world, including punctuality, adherence to work procedures, responsibility for practical assignments, and consistency in equipment use and safety. Therefore, students with high learning discipline not only demonstrate better academic performance but also have higher job readiness as vocational education graduates. The results of this study indicate that improving student achievement at SMK Negeri 1 Tomohon can be achieved by strengthening a culture of academic discipline, implementing consistent classroom management, instilling a habit of structured learning, and developing a continuous learning monitoring and evaluation system. Furthermore, teachers need to build a learning environment that supports the development of self-discipline through active learning approaches, project-based learning, and assigning clear academic responsibilities to students. Thus, learning discipline serves not only as a code of conduct but also as a foundation for the development of professional competencies in vocational education students who are ready to face the demands of the working world.

The results of this study reinforce the theory of self-regulated learning, which asserts that academic success is influenced by students' ability to independently manage motivation, learning behavior, and academic engagement. According to Barry J. Zimmerman, students with high self-regulation tend to be able to maintain learning focus, set academic goals, and effectively control learning behavior, thus impacting academic achievement. Furthermore, the results of this study also support Angela Duckworth's view that learning success is strongly influenced by individual self-discipline and persistence in undergoing the learning process. Therefore, this study provides practical implications that vocational schools need to develop learning strategies that can increase student engagement, strengthen a culture of discipline, and create an academic environment that supports the formation of strong learning characters. The implementation of project-based learning, strengthening academic mentoring, and implementing continuous evaluation can be effective strategies to increase the commitment and discipline of vocational high school students. Thus, this study not only provides a theoretical contribution to the development of vocational education studies but also produces relevant evidence-based recommendations (evidence-based practice) in an effort to improve the quality of vocational high school graduates who are adaptive, competent, and ready to work in the modern industrial era. This is in line with the views of Zimmerman and Schunk (2011) who emphasized that students' academic success is greatly influenced by self-regulation skills, namely the individual's ability to manage motivation, learning strategies, behavioral control, and academic involvement independently and continuously.

CONCLUSION

Based on the research results, it can be concluded that learning commitment and learning discipline have a direct positive influence on the learning achievement of students at SMK Negeri 1 Tomohon. The research findings show that learning commitment contributes significantly to improving student learning achievement, indicating that student engagement with learning goals, academic responsibility, and consistency in the learning process are important factors in supporting academic success. In addition, learning discipline has been shown to have a stronger influence on learning achievement, indicating that students' ability to manage time, comply with learning rules, maintain consistent academic behavior, and maintain regularity in the learning process are the main

determinants in improving the learning achievement of vocational school students. In the context of vocational education, these two variables have a strategic position because vocational learning not only requires mastery of cognitive aspects, but also the formation of professional character, work responsibilities, and readiness to face the demands of the industrial world. Thus, improving the quality of learning achievement of vocational school students cannot only focus on pedagogical aspects alone, but also needs to be directed at strengthening learning commitment and establishing a culture of sustainable academic discipline.

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