

The Influence of Learning Motivation and Learning Environment on Student Engagement with Self-Efficacy as Mediator

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ABSTRACT

This study examines the effects of learning motivation and the learning environment on student engagement, with self-efficacy serving as a mediating variable, among students at State Vocational High School 2 Pariaman. Employing a quantitative approach with a causal research design, the study involved a population of 741 students enrolled in Grades X and XI. A sample of 170 students was selected to participate in the research. Data were analyzed using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) method through SmartPLS version 4.1.1.8. The findings indicate that both learning motivation and the learning environment each exert a positive and statistically significant effects on student engagement. Likewise, these two variables significantly enhance students' self-efficacy. In addition, self-efficacy demonstrated a positive and significant effect on student engagement. The mediation analysis further confirmed that self-efficacy significantly mediates the relationships between learning motivation and student engagement, as well as the relationships between the learning environment and student engagement. Overall, these findings highlight that improving students' learning motivation, creating a supportive learning environment, and strengthening self-efficacy are key factors in fostering greater student engagement in the learning process.

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INTRODUCTION

Education plays an important role in preparing students to develop the knowledge, skills, and adaptability needed to respond to changing demands. However, achieving meaningful learning outcomes requires more than effective curricula and instructional

strategies. Students also need to be show active participation in learning, particularly as changes in learning systems and digitalization may create challenges in maintaining students' attention, participation, and learning responsibility (Hati, 2025; Ibrahim et al., 2024).

Student engagement represents the extent of students' participation in the learning process across behavioral, emotional, and cognitive aspects (Wong & Liem, 2022; Tang & Hew, 2022). Higher engagement is associated with better academic performance, learning experiences, and students' ability to deal with academic tasks (Niittylahti et al., 2021; Krismiyati & Yulia., 2023).

The development of student engagement can be understood through Bandura's Social Cognitive Theory, particularly the concept of Triadic Reciprocal Determinism, which explains how personal characteristics, environmental conditions, and behavior (Bandura, 1997). From this perspective, learning motivation represents a personal factor, the learning environment reflects an external factor, and student engagement represents learning behavior. The interaction among these components indicates that student engagement arises from the combined influence of environmental conditions, psychological beliefs, and motivation.

Self-efficacy is particularly important in explaining this process because it represents students' confidence in their capacity to organize and perform the necessary actions to attain particular goals (Bandura, 1997). A high level of self-efficacy encourages students to put forth more effort, persist when encountering difficulties, and actively participate in learning activities. Thus, self-efficacy can serve as a psychological mechanism that connects personal and environmental factors with student engagement.

However, conditions in the field indicate that student engagement in the learning process is still less than optimal. Observations conducted by the author during the Educational Field Practice (PLK) at SMK Negeri 2 Pariaman, students were observed to participate less frequently in class discussions by asking and answering questions, less enthusiastic about participating in learning, and tended to be passive during the learning process. Furthermore, some students failed to make an effort to understand the material in depth and only participated in learning as a form of fulfilling obligations. The study's finding also concur with a result reported study by Liu and Xie (2024), indicated that students with low engagement tended to participate and interact minimally and easily became bored. Similarly, Vo and Ho (2024) also found that the low levels of student engagement were characterized by limited attention, reduced participation, and insufficient effort during the learning activities.

Student engagement is influenced by various aspects, one of which is learning motivation, which can decrease student engagement levels (Singh et al., 2022). Learning motivation plays a crucial role in influencing student engagement. Self-Determination Theory (SDT) explains that students' active involvement in learning can be strengthened when their psychological needs for autonomy, competence, and relatedness are adequately fulfilled (Ryan & Deci, 2020). These needs foster students' willingness to participate, persist, and dedicate themselves in learning activities. Thus, stronger learning motivation can encourage greater behavioral, emotional, and cognitive

engagement. This argument is reinforced by Singh et al. (2022) and Raihan dan Marsita (2024), who found that learning motivation positively contributes to student engagement.

Besides learning motivation, the learning environment is an important factor influencing student engagement (Nasution et al., 2024). It includes conditions within the family, school, and community that can either support or hinder learning (Slameto, 2010; Erita et al., 2022). Fredricks et al. (2004) conceptualize student engagement as comprising three interconnected dimensions: behavioral, emotional, and cognitive shaped by school, classroom, and family contexts. However, an environment that is not fully supportive, including inconsistent learning support and less conducive conditions, may limit students' engagement. Therefore, a supportive learning environment is essential for promoting active participation, positive emotional involvement, and cognitive engagement. This is supported by Ernawati et al. (2022), Nuha et al. (2022), and Hanipah et al. (2022), whose findings indicate that a conducive learning environment can promote greater student participation and engagement.

Previous research has demonstrated that learning systems supported by learning motivation and a supportive learning environment can increase student engagement in learning activities (Masrun & Rusdinal, 2022). However, several other studies have found mixed results. According to the findings of Oktapiani et al. (2025), academic motivation does not by itself lead to optimal student engagement unless it is reinforced by high levels of self-efficacy. Self-efficacy represents an individuals' their perception of their own capabilities to successfully carry out academic responsibilities and accomplish intended learning outcomes. As such, it serves as a critical factor in shaping students' learning behaviors and fostering engagement in educational activities (Putro & Bernarto, 2024). Therefore, this study considers self-efficacy as a mediating variable to offer a more comprehensive explanation of how learning motivation and the learning environment promote student engagement during the learning process.

Based on an initial survey of 60 students at State Vocational High School 2 Pariaman, learning motivation, the learning environment, and self-efficacy were predominantly at a moderate level, indicating the need to strengthen student engagement. Although earlier research has investigated how learning motivation, learning environment, self-efficacy, and student engagement, limited attention has been given to their interrelationships within vocational education. Unlike general high schools, vocational education emphasizes practical skills, workplace-oriented learning, and students' preparation for future employment, making student engagement particularly important. Therefore, this study investigates how learning motivation and the learning environment on student engagement through self-efficacy among students at State Vocational High School 2 Pariaman.

METHOD

This study uses a quantitative and causal approach. This study aims to investigate the magnitude of the influence of learning motivation and the learning environment on student engagement by examining the direct relationship and indirect mediating role of self-efficacy. The study population was 741 students enrolled in grades X and XI at State

Vocational High School 2 Pariaman. The research sample was selected through a probability sampling technique, namely Proportional Stratified Random Sampling (PSRS) technique. The sample size was established following the established guidelines proposed by Hair et al. (2019). This study used SEM with 17 indicators, which were then multiplied by ten, resulting in a total of 170 respondents.

The study employed a questionnaire employing a five-point Likert scale as the primary research instrument. Learning motivation was assessed using eight indicators: persistence in completing tasks, perseverance in overcoming difficulties, interest in a variety of problems, an inclination toward independent work, a tendency to lose interest in repetitive activities, and the ability to stand by one's opinions, consistency in maintaining personal beliefs, and enjoyment of solving problems (Sardiman, 2012). The learning environment was measured through three indicators: family, school and community environment (Slameto, 2010). Student engagement was assessed through three indicators: behavioral, emotional, and cognitive engagement (Fredricks et al., 2004). Self-efficacy was assessed through three indicators: magnitude (the degree of task difficulty believed achievable), generality (confidence in ability), and strength (Bandura, 1997).

Data analysis techniques were carried out in two stages: descriptive analysis to describe the collected data, and quantitative analysis using two models: a measurement model (outer model) using convergent validity tests, discriminant validity, and construct reliability, and a structural model (inner model) using r-square, f-square, predictive relevance (Q²) and hypothesis testing. The Structural Equation Modeling–Partial Least Squares (SEM-PLS) method was applied to analyze the data using SmartPLS 4 software.

RESULT AND DISCUSSION

RESULTS

Outer Model

Tabel 1. Outer Loading and Cross Loading

	Self-Efficacy (Z)	Student Engagement (Y)	Learning Environment (X2)	Lernaning Motivation (X1)
SE1	0.857	0.471	0.388	0.529
SE2	0.794	0.427	0.402	0.400
SE3	0.771	0.370	0.385	0.416
STD1	0.391	0.777	0.375	0.388
STD2	0.471	0.858	0.440	0.541
STD3	0.375	0.731	0.287	0.384
LE1	0.366	0.332	0.750	0.317
LE2	0.463	0.449	0.885	0.411
LE3	0.302	0.327	0.740	0.265
LM1	0.503	0.483	0.454	0.756
LM2	0.456	0.480	0.314	0.700
LM3	0.453	0.375	0.273	0.759

LM4	0.397	0.347	0.236	0.764
LM5	0.398	0.423	0.201	0.797
LM6	0.400	0.440	0.299	0.826
LM7	0.374	0.425	0.285	0.786
LM8	0.397	0.428	0.488	0.710

Source: Primary Data, Processed by SmartPLS V 4.2026

The measurement results presented in the table indicate that all indicators across all research constructs demonstrated outer loading values above 0.70. In accordance with the criterion recommended by Hair (2014), all constructs demonstrated adequate convergent validity.

Tabel 2. Validity and Reliability Test

Variable	Crombach's Alpha	Composite Reliability	AVE
Student Engagemnt (Y)	0,710	0,833	0,625
Learning Motivation (X1)	0,897	0,918	0,538
Learning Environment (X2)	0,707	0,836	0,631
Self Efficacy (Z)	0,734	0,849	0,653

Source: Primary Data, Processed by SmartPLS V 4 2026

The validity and reliability findings tests demonstrate that all constructs satisfy the required measurement standards. All variables recorded Cronbach's alpha values above 0.70, indicating an acceptable level of internal consistency. Additionally, the AVE results for each construct surpassed the minimum criterion of 0.50, confirming that the the constructs demonstrate adequate convergent validity. Accordingly, all constructs used in this study can be fulfilled the required validity and reliabilit and are appropriate for subsequent analysis.

Tabel.3 Heterotrait-Monotrait Ratio (HTMT) Test

Variable	Self Efficacy	Student Engagemnt	Learning Environment	Learning Motivation
Self Efficacy (Z)				
Student Engagemnt (Y)	0,724			
Learning Environment (X2)	0,662	0,651		
Learning Motivation (X1)	0,678	0,691	0,515	

Source: Primary Data, Processed by SmartPLS V 4 2026

The HTMT findings demonstrate adequate discriminant validity, as all values are below the recommended threshold of 0.90. This shows that each variable is separate and represents a different concept. Therefore, the research model fulfills the requirements for discriminant validity and appropriate for subsequent analysis.

Structural Model Maesurement (Inner Model)

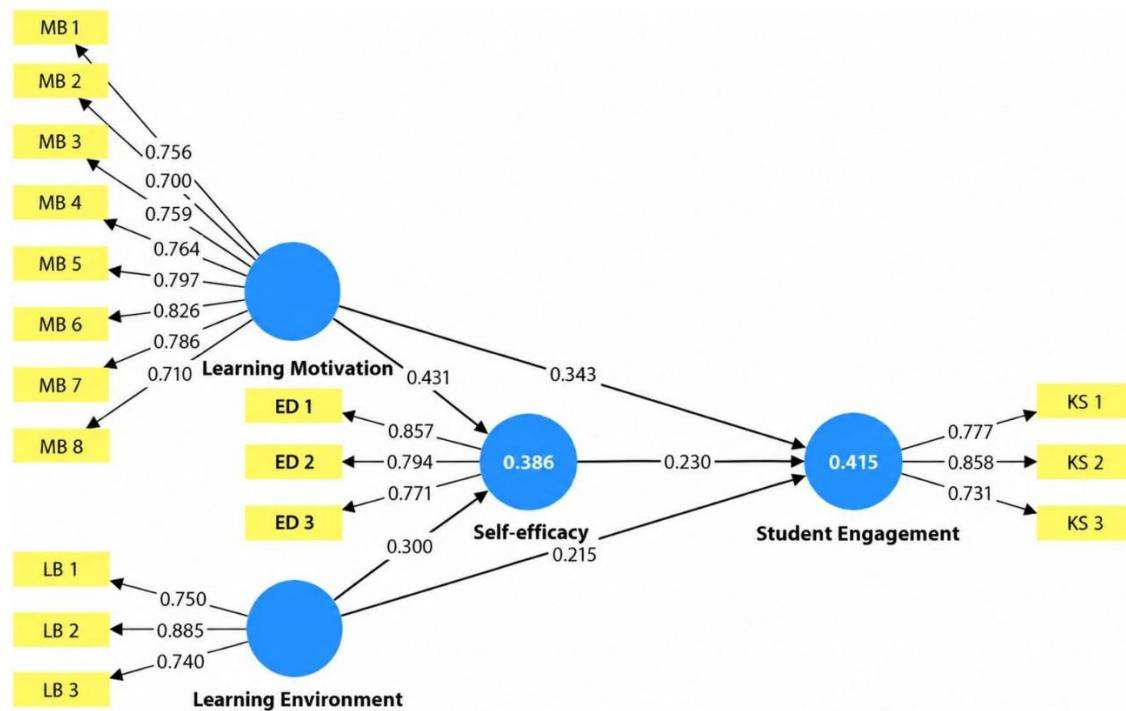


Figure 1. Inner Model 2026

Source: Primary Data, Processed by SmartPLS V 4 2026

In PLS-SEM, structural model assessment begins with an analysis of the coefficient of determination (R^2) for each dependent latent variable. The R^2 values obtained from the SmartPLS analysis are presented in the following table.

R-Square

Table 4. R-Square Result

Variable	R-Square	Adjusted R-Square
Self Efficacy (Z)	0,386	0,379
Student Engagement (Y)	0,415	0,405

Source: Primary Data, Processed by SmartPLS V 4 2026

The coefficient of determination result show that Learning Motivation and the Learning Environment accounted for 38.6% of Self-Efficacy ($R^2 = 0.386$), while Learning Motivation, the Learning Environment, and Self-Efficacy collectively explained 41.5% of the variation in Student Engagement ($R^2 = 0.415$). These findings demonstrate that the proposed model offers moderate explanatory power for the two endogenous constructs, whereas the unexplained variation may be attributed to factors not incorporated into the model.

Q-Square (Q²)

Tabel 5. Predictive Relavance Value (Q²)

Variable	Q ² Predict	RMSE
Self Efficacy (Z)	0,351	0,821
Student Engagement (Y)	0,358	0,811

Source: Primary Data, Processed by SmartPLS V 4.0 2026

The predictive relevance values for Self-Efficacy 0.351 and Student Engagement 0.358 were both above zero, indicating that the model provides adequate predictive relevance for the endogenous constructs.

F-Square (Effect Size)

Tabel 6. Effect Sice (F²)

	Self-Efficacy	Student Engagement
Self-Efficacy		0,056
Student Engagement		
Learning Environment	0,120	0,058
Learning Motivation	0,248	0,132

Source: Primary Data, Processed by SmartPLS V 4.0 2026

The results of the F score table show that only one variable has a positive effect with a moderate category, namely the learning motivation variable on self-efficacy with a score of 0.248, while other variables have a positive effect but with a weak category.

Hypothesis Testing

Direct Influence Hypothesis and Indirect Effect Hypothesis

The results of the direct and indirect effect testing are presented below.

Tabel 7. Result of Inner Model Analysis of Direct Effect and Indirect Effect

Hipotesis	Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistikcs (O/STDEV)	P values
H1	X1 – Y	0.343	0.344	0.078	4.407	0.000
H2	X2 - Y	0.215	0.214	0.075	2.856	0.004
H3	X1 - Z	0.431	0.440	0.079	5.489	0.000
H4	X2 - Z	0.300	0.299	0.070	4.266	0.000
H5	Z - Y	0.230	0.233	00.79	2.919	0.004
H6	X1 – Z - Y	0.099	0.101	0.038	2.613	0.009
H7	X2 – Z - Y	0.069	0.070	0.031	2.218	0.027

Source: Primary Data, Processed by SmartPLS V 4.0 2026

Hypothesis 1: Learning motivation has a significant positive influences student engagement at State Vocational High School 2 Pariaman. This result is supported by a T-value of 4.407, which is greater than the critical threshold of 1.96, together with a p-value of 0.000, well below 0.05 significance criterion. Therefore, the first hypothesis is supported.

Hypothesis 2: Learning environment has a significant positive influences student engagement at State Vocational High School 2 Pariaman. This result is supported by a T-value of 2.856, which is greater than the critical threshold of 1.96, together with a P-value of 0.004, well below 0.05 significance criterion. Therefore, the second hypothesis is supported.

Hypothesis 3: Learning motivation has a significant positive influences student self-efficacy at State Vocational High School 2 Pariaman, with a calculated T-value of 5.489, greater than the T-value of 1.96, and a P-value of 0.000, well below 0.05. Therefore, the third hypothesis is supported.

Hypothesis 4: Learning environment has a significant positive influences student self-efficacy at State Vocational High School 2 Pariaman. This result is supported by a T-value of 4.266, which is greater than the critical threshold of 1.96, and together with a P-value of 0.000, well below 0.05 significance criterion. Therefore, the fourth hypothesis is supported.

Hypothesis 5: Self-efficacy has a significant positive influences student engagement at State Vocational High School 2 Pariaman, with a calculate T-value of 2.919, greater than the T-value of 1.96, and a P-value of 0.004, well below 0.05. Therefore, the five hypothesis is supported.

Hypothesis 6: Learning motivation has a significant positive influences student engagement at State Vocational High School 2 Pariaman through self-efficacy. This result is supported by T-value of 2.613, which is greater than the critical threshold of 1.96, together with a P-value of 0.009, well below 0.05 significance criterion. Therefore, the sixth hypothesis is supported.

Hypothesis 7: The learning environment has a significant positive influences student engagement at State Vocational High School 2 Pariaman through self-efficacy. This results are supported by T-value of 2.218, wich is greater than the critical threshold of 1.96, together with a P-value of 0.027, well below 0.05 significance criterion. Therefore, the seventh hypothesis is supported.

DISCUSSION

The Influence of Learning Motivation on Student Engagement at State Vocational High School 2 Pariaman

The results of Hypothesis 1 indicate that Learning Motivation has a significant positive influences Student Engagement at State Vocational High School 2 Pariaman. This finding indicates that learners who are more demonstrate a strong learning tend to demonstrate greater involvement in the learning process. Drawing on the perspective of Self-Determination Theory, motivation encourages engagement when students' needs for autonomy, competence, and relatedness are sufficiently fulfilled during learning activities (Ryan & Deci, 2020). The fulfillment of these psychological needs can foster

students' active participation, persist in completing tasks, and invest greater effort in learning. As a result, students with strong motivation tend to show behavioral engagement reflected in active participation, emotional engagement demonstrated through increased enthusiasm and interest, and cognitive engagement characterized by deeper learning and understanding.

This relationship is particularly relevant within vocational education settings, where learners are expected but also to acquire theoretical knowledge as well to develop practical skills and prepare for future demands employment. Students who demonstrate greater levels of learning motivation tend to persist when facing academic or practical difficulties and to actively participate in activities that require skills and problem-solving. Thus, motivation can function as an internal driving force that sustains students' involvement throughout the learning process at State Vocational High School 2 Pariaman. These findings are consistent with Raihan and Marsita (2024), whose findings demonstrated that learning motivation significantly contributes to student engagement, and with Singh et al. (2022), whose findings highlighted the significant contribution of cognitive motivation to strengthening student engagement.

The Influence of Learning Environment on Student Engagement at State Vocational High School 2 Pariaman

The results of Hypothesis 2 indicate that Learning Environment has a significant positive influences Student Engagement at State Vocational High School 2 Pariaman. This finding indicates that learners who experience a more conducive learning environment tend to participate more actively, show greater enthusiasm, and invest more effort in learning activities. The relationship can be explained by Bandura's Social Cognitive Theory, particularly Triadic Reciprocal Determinism, which emphasizes the dynamic interplay among environmental influences, individual factors, and behavior (Bandura, 2001). A supportive environment provides encouragement, guidance, positive interactions, and learning experiences that can enhance students' confidence and readiness to actively engage in learning activities.

This relationship holds particular significance within vocational education, where student are expected to develop academic knowledge alongside practical competencies and preparation for the workplace. A supportive family can provide emotional and academic encouragement, while a positive school environment can facilitate constructive teacher-student interactions and effective learning activities. Social interactions outside school may also provide experiences that shape students' attitudes toward learning. These conditions can encourage behavioral participation, positive emotional involvement, and cognitive investment, consistent with the three dimensions of student engagement proposed by Fredricks et al. (2004).

These findings are consistent with Wang (2024) and Ernawati et al. (2022), who reported that supportive learning environments contribute to higher student engagement. Thus, the significant relationship identified in this study suggests that student engagement at State Vocational High School 2 Pariaman influenced by both individual characteristics

and the environmental conditions that provide students with support, positive interactions, and opportunities to engage meaningfully in learning.

The Influence of Learning Motivation on Students' Self-Efficacy at State Vocational High School 2 Pariaman

The results of Hypothesis 3 indicate that Learning Motivation has a significant positive influences students' self-efficacy at State Vocational High School 2 Pariaman. The relatively strong path coefficient indicates that learning motivation has a substantial influence on strengthening students' beliefs in their learning abilities. From Bandura's Social Cognitive Theory, motivated students are more likely to exert effort, persist when facing difficulties, and actively engage in learning tasks. These experiences enable students to acknowledge their learning progress and successful task completion, which can strengthen their confidence in their own capabilities (Bandura, 2001).

This relationship holds particular significance within vocational education, where students need to develop practical skills and complete learning tasks that involve both knowledge and hands-on activities. Students who are motivated to master these tasks tend to remain persistent when facing challenges and gain successful learning experiences, thereby reinforcing their self-efficacy. In the context of State Vocational High School 2 Pariaman, learning motivation may therefore become an important internal factor that helps students develop greater confidence in understanding materials, completing assignments, and handling learning difficulties.

These findings are consistent with Anggraini and Tusyanah (2023), who found that learning motivation positively influences students' self-efficacy. Luthfianti et al. (2024) similarly reported a strong the association between learning motivation and self-efficacy. Thus, the present findings suggest that motivation supports the enhancement of self-efficacy not merely by encouraging students to learn, but through sustained effort, persistence, and successful learning experiences that strengthen their beliefs in their capabilities.

The Influence of Learning Environment on Students' Self-Efficacy at State Vocational High School 2 Pariaman.

The results of Hypothesis 4 indicate that Learning Environment has a significant positive influences students' self-efficacy at State Vocational High School 2 Pariaman. This finding demonstrate that a supportive learning environment can strengthen students' beliefs regarding their capacity to understand lessons, accomplish academic tasks and address academic difficulties. From Bandura's Social Cognitive Theory, environmental conditions influence students' personal beliefs through learning experiences, social interaction, feedback, and encouragement. Positive experiences and support from teachers, family, peers, and the surrounding community can provide students with greater confidence in their capabilities and encourage them to approach learning challenges more positively.

This relationship holds particular significance within vocational education, where students are required to develop both theoretical knowledge and practical competencies.

Opportunities to practice skills, receive guidance, and obtain positive feedback can help students recognize their capabilities and gradually strengthen their self-efficacy. In the context of State Vocational High School 2 Pariaman, a supportive learning environment may therefore provide the experiences and social support necessary for students to develop stronger confidence in carrying out academic and practical learning tasks.

These findings are consistent with Masrun and Rusdinal (2022), who found that the learning environment positively influences students' self-efficacy. Similarly, Simaremare (2023) found that a conducive school environment helps strengthen students' self-efficacy.. Therefore, the significant relationship identified in this study suggests that students' confidence in their learning abilities is influenced by both personal characteristics and the quality of the environment in which learning occurs.

The Influence of Self Efficacy on Student Engagement at State Vocational High School 2 Pariaman.

The results of Hypothesis 5 indicate that self-efficacy has a significant positive influences student engagement at State Vocational High School 2 Pariaman. Students with greater confidence in their capabilities tend to participate actively, persist when facing difficulties, and invest effort in achieving their learning goals. From Bandura's Social Cognitive Theory, self-efficacy conditions influences students' motivation, choices, effort, and persistence when performing a task. Therefore, students who have belief in their capacity to completing learning tasks tend to approach challenges confidently instead of avoiding them, which strengthens their behavioral, emotional, and cognitive engagement.

This relationship holds particular significance within vocational education because students are expected to develop academic knowledge as well as practical competencies. Learning activities that involve practice, problem solving, and task completion require students to believe in their ability to perform successfully. At State Vocational High School 2 Pariaman, stronger self-efficacy may therefore encourage students to participate in classroom activities, remain focused on learning tasks, and persist in completing academic and practical assignments despite difficulties.

These findings are consistent Wu (2023), who found that self-efficacy is positively linked to student engagement. Similarly, Putwain et al. (2023) found that students with stronger self-efficacy tend to show higher academic engagement by setting clearer goals and applying more effective learning strategies. Putro dan Bernarto (2024) also reported that academic self-efficacy promotes active participation, sustained attention, and persistence in completing learning tasks. These results indicate that self-efficacy extends beyond students' perceptions of their abilities, serving as a psychological process that enables vocational students to convert their confidence into active and sustained involvement in learning.

The Influence of Learning Motivation and the Learning Environment on Student Engagement Through Student Self-Efficacy at State Vocational High School 2 Pariaman.

The results of Hypotheses 6 and 7 provide evidence that self-efficacy mediates the influence of learning motivation and the learning environment on student engagement at State Vocational High School 2 Pariaman. This finding suggests that motivation and environmental support contribute to student engagement not only directly but also by strengthening students' beliefs in their own capabilities. Psychologically, Students with strong motivation tend to remain engaged in the learning process. tasks and invest effort, while a supportive environment provides encouragement, guidance, feedback, and positive learning experiences. These conditions can strengthen self-efficacy, which subsequently encourages students to participate more actively, persist when facing difficulties, and invest greater attention and effort in learning.

The mediating role of self-efficacy can be understood through Bandura's Social Cognitive Theory, particularly the reciprocal interaction between personal factors, environmental conditions, and behavior (Bandura, 2001). In this study, learning motivation represents a personal factor and the learning environment represents an environmental factor, while self-efficacy serves as a key psychological mechanism that helps translate these factors into student engagement. When students have confidence in their ability to understanding lessons, completing tasks, and overcoming learning difficulties, they are more likely to demonstrate behavioral, emotional, and cognitive engagement.

This mechanism is particularly relevant within vocational education, where students are prepared to develop academic knowledge alongside practical competencies and preparation for future employment. Learning activities that provide opportunities for practice, feedback, guidance, and successful task completion can strengthen students' perceptions of their capabilities. At State Vocational High School 2 Pariaman, these experiences may help students become more confident in facing both academic and practical learning demands, thereby increasing their willingness to remain actively involved and persevere throughout the learning process.

These findings are consistent with Alemayehu and Chen (2023), who found that the association between learning motivation and student engagement is mediated by self-efficacy; students with higher self-efficacy exhibit greater learning engagement. The results also concur with Wang (2024), indicating that self-efficacy mediates the effect of the learning environment on student engagement, as a positive environment can shape students' self-belief, thereby fostering higher levels of engagement. Moreover, the results align with Huang et al. (2024), who found that self-efficacy serves as a psychological mechanism bridging the effects of external factors and learning engagement. Accordingly, self-efficacy serves as a psychological channel through which personal motivation and environmental support can be translated into stronger student engagement.

CONCLUSIONS

This study concludes that learning motivation and the learning environment positively affect student engagement at State Vocational High School 2 Pariaman, through both a direct pathway and an indirect pathway mediated by self-efficacy. Self-efficacy contributes positively to student engagement and serves as a mediating mechanism between learning motivation, the learning environment, and student engagement. The findings reveal that student engagement is shaped by both by students' motivation and learning conditions as well as by their confidence in their own abilities. The findings support Social Cognitive Theory, particularly the concept of Triadic Reciprocal Determinism, which highlights the dynamic interplay among personal factors, environmental conditions, and behavior. Schools and teachers should therefore strengthen learning motivation, provide a supportive learning environment, and develop students' self-efficacy to encourage greater engagement in learning. The scope of this study is restricted to students at a single vocational high school and examines only learning motivation, the learning environment, self-efficacy, and student engagement. Future research should involve broader populations and consider other factors that may influence student engagement.

AUTHOR CONTRIBUTION

Riska Febriyati Nengsih 1: Conceptualization, methodology, investigation, data management, data analysis and writing the initial draft.

Armiati 2: Supervision, validation, review and editing of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SIMILARITY STATEMENT

The authors confirm that this manuscript is original and has passed institutional Turnitin screening within the required similarity threshold.

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