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THE INFLUENCE OF SCHOOL CLIMATE ON LEARNING EFFECTIVENESS MEDIATED BY STUDENT LEARNING MOTIVATION

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Abstract

This study aims to analyze the effect of school climate on learning effectiveness mediated by student learning motivation at public high school, Subang Regency. This study uses a quantitative approach with a survey method involving 146 students selected through purposive sampling. Data collection was conducted using a unipolar positive numerical scale questionnaire of 1–5 and analyzed using path analysis with SmartPLS 3. The results showed that school climate had a positive and significant effect on learning effectiveness, school climate has a significant effect on learning motivation, and learning motivation has a significant effect on learning effectiveness. In addition, learning motivation significantly mediates the relationship between school climate and learning effectiveness. These results indicate that a positive school climate can increase students' intrinsic motivation, which in turn strengthens learning effectiveness. This study supports the Self-Determination theory, which emphasizes the importance of autonomy, competence, and relatedness in learning. These findings have practical implications that strengthening a positive and supportive school climate is an important strategy in improving the quality of learning and student achievement.

Keywords: School Climate; Learning Motivation; Learning Effectiveness

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INTRODUCTION

Education is a key pillar in the development of high-quality and competitive human resources. Quality education stems from an effective learning process (Nofriansyah et al., 2024). The quality of education is highly dependent on an effective learning process, which does not only rely on teaching materials alone, but also involves dynamic interactions between students, educators, and the learning environment (Nofriansyah et al., 2024; Rahayu et al., 2025; Nofriansyah et al., 2025). Learning effectiveness is a measure of the success of the interaction between students and their peers or educators in an educational setting to achieve learning objectives (Rohmawati, 2015; Ahmad, 2021; Nofriansyah et al., 2025). Student learning effectiveness encompasses mastery of material, application of knowledge, critical thinking skills, and optimal academic achievement (Slavin, 2020). However, the latest data from the 2022 Programme for International Student Assessment (PISA) shows that the average score of Indonesian students ranks 71st out of 77 participating countries in reading literacy, mathematics, and science (OECD, 2023). This condition indicates a serious challenge in achieving learning effectiveness at the high school level in Indonesia.

At the local level, Public High School 1 Cipeundeuy, a school in Subang district, shows significant variation in student academic achievement. Initial observations reveal that around 35% of students are less active in the learning process, 28% do not complete their assignments on time, and 22% have average test scores below the school's graduation standard. This phenomenon raises questions about the factors that influence learning effectiveness. Learning effectiveness is influenced by various factors, both internal and external. One external factor that influences learning effectiveness is the school climate. Teachers' and students' perceptions of the psychological and social climate in the school setting are reflected in the school climate (Cohen et al., 2009). Student engagement in the learning process is facilitated by a healthy school atmosphere, which fosters a sense of safety, trust, and emotional support (Thapa, Cohen, Guffey, and Higgins-D'Alessandro, 2013). According to research, student involvement and academic achievement are significantly impacted by school atmosphere (Wang & Degol, 2016; Zullig, Koopman, Patton, and Ubbes, 2020).

Based on initial observations and interviews with teachers, there is still variation in student motivation to learn. Some students show high motivation, but others appear less motivated to participate in the learning process. This condition is likely influenced by differences in perceptions of the school atmosphere, teacher support, and social relationships in the school environment. This statement is reinforced by a report from the Ministry of Education and Culture (2023), which found that 42% of high school students stated that they felt "uncomfortable" at school due to academic pressure, disharmonious social relationships, or authoritarian approaches by teachers. This condition has an impact on low motivation and learning effectiveness.

Learning motivation is a key mediator that bridges the gap between the impact of school climate and student learning outcomes, according to a number of research (Deci & Ryan, 2000; Niehaus, Rudasill, and Rakes, 2012). Extrinsic and intrinsic motivation are the two categories of learning motivation. Intrinsic motivation is the drive that comes from within the student to master the material, while extrinsic motivation is the drive that is influenced by the environment, rewards, or recognition from teachers and parents (Deci & Ryan, 2020; Schunk et al., 2022). In Self-Determination Theory (SDT) by Deci & Ryan (1985), it is explained that students' intrinsic motivation develops when three basic psychological needs, namely autonomy, competence, and relatedness, are fulfilled in the school environment. A positive school environment encourages a sense of belonging, freedom to learn, and appreciation for students' abilities, thereby increasing learning motivation (Ryan & Deci, 2017). Furthermore, research by Jia et al. (2022) shows that a socially and emotionally supportive school climate contributes to an increase in students' intrinsic motivation. Similar results were found by Diseth & Samdal (2021), who stated that students' perceptions of teacher support and peer relationships have a direct effect on learning motivation and academic well-being.

These findings confirm that to improve learning effectiveness, schools need to pay attention to psychosocial factors that influence student learning motivation, including school climate. In the context of Public High School 1 Cipeundeuy, there is a gap between academic expectations and reality in the field. Although some students have good academic potential, low motivation and lack of support from the learning environment prevent them from achieving maximum learning effectiveness. This circumstance highlights the necessity of conducting studies that examine how school climate affects learning effectiveness and how learning motivation modifies the relationship between school climate and learning effectiveness. As a result, the following are the hypotheses put out in this study:

H1: The effectiveness of student learning is positively and significantly impacted by school climate.
H2: Student motivation for learning is positively and significantly impacted by school climate.
H3: Student learning effectiveness is positively and significantly impacted by learning motivation.
H_4: Learning motivation significantly mediates the relationship between school climate and student learning effectiveness.

This study is expected to provide practical contributions to school principals, teachers, and education policymakers in designing strategies to improve learning effectiveness through strengthening the school climate and student learning motivation.

METHODS

This study examines how school atmosphere affects learning effectiveness through learning motivation using a quantitative approach that includes survey and path analytic approaches. Path analysis was used to assess the direct and indirect effects between variables in accordance with the suggested procedure, while the quantitative approach was selected because the study's goals were to test the suggested mediation model and measure the relationship between variables numerically (Hair et al., 2019). The research was conducted at Public High School 1 Cipeundeuy, Subang Regency, in the odd semester of the 2025/2026 academic year, from August to September 2025. This location was chosen because of its representative number of students and the ease of obtaining data related to school climate perception, learning motivation, and learning effectiveness. The research population included all 12th grade students, totaling approximately 232 students, with a sample of 146 students selected using purposive sampling, with the criteria of students who actively participated in learning and were willing to be respondents.

The research instrument was a closed-ended questionnaire with a unipolar numerical scale of 1–5, designed to measure three main variables. The school climate variable was measured using 6 indicators according to Cohen et al. (2009), Specifically, 1) regulations and standards, 2) physical security, 3) emotional and social security, 4) educational support, 5) civic and social education, and 6) tolerance for variety. The learning motivation variable was measured based on Self-Determination Theory (Deci & Ryan, 1985; Ryan & Deci, 2020) through five indicators, including 1) desire to learn due to personal interest (intrinsic interest), 2) effort to achieve academic goals (goal-directed effort), 3) persistence in the face of difficulties, 4) active involvement in learning activities, and 5) response to teacher feedback. Meanwhile, the learning effectiveness variable was measured using four indicators according to Slavin (2020), namely 1) achievement of learning objectives, 2) active participation in learning, 3) perseverance and consistency, and 4) ability to apply knowledge. Each indicator of each variable consists of two questionnaire statements. Cronbach's alpha was used to examine the questionnaire's content validity and reliability; an internal consistency score of $\alpha \geq 0.70$ indicates sufficient internal consistency.

Data was collected in phases, starting with the production of research permits and instruments, then distributing questionnaires in-person in class under the guidance of researchers, and finally collecting and validating the data to guarantee its validity and completeness. In order to assess the direct impact of school climate on learning

effectiveness as well as the indirect impact through learning motivation acting as a mediator, the gathered data were subsequently subjected to path analysis using SmartPLS 3 software. Path coefficients, R2 values, and statistical significance at a 95% confidence level ($p < 0.05$) were used to describe the analysis results. Deci & Ryan (1985) and Ryan & Deci (2020) for learning motivation, Slavin (2020) for learning effectiveness, Hair et al. (2019) for route analysis methodologies, and Cohen et al. (2009) for school climate indicators were among the methodological sources cited.

RESULTS & DISCUSSION

Results

146 students from Public High School 1 Cipeundeuy in Subang Regency participated in this study. Three primary variables—school atmosphere (X), learning motivation (M), and learning effectiveness (Y)—were examined using a positive unipolar numerical scale of 1–5 in the questionnaire used to collect the research data. Validity and reliability tests were performed to evaluate the study tools' dependability. According to the findings of the validity test, every item met the standards for validity as its outer loading values and AVE values were both greater than 0.70 and 0.50, respectively (Hair et al., 2019). Similarly, the reliability test results obtained Cronbach's Alpha values of 0,970 for school climate, 0,966 for learning motivation, and 0,978 for learning effectiveness, so that all instruments were declared reliable. The findings of the research instrument test are shown in the following table for further information.

Table 1.
Instrument Validity and Reliability Test Results

Variable	Item	Factor loading	AVE	Cronbach's Alpha	Composite reliability
School Climate	IS1	0,801	0,752	0,970	0,973
	IS2	0,867			
	IS3	0,882			
	IS4	0,864			
	IS5	0,896			
	IS6	0,862			
	IS7	0,845			
	IS8	0,940			
	IS9	0,862			
	IS10	0,863			
	IS11	0,882			
	IS12	0,836			
Learning Motivation	MB1	0,807	0,766	0,966	0,970
	MB2	0,862			
	MB3	0,889			
	MB4	0,840			
	MB5	0,898			
	MB6	0,898			
	MB7	0,895			
	MB8	0,862			
	MB9	0,889			

	MB10	0,901			
Learning	EB1	0,909	0,869	0,978	0,981
Effectiveness	EB2	0,924			
	EB3	0,938			
	EB4	0,933			
	EB5	0,960			
	EB6	0,935			
	EB7	0,921			
	EB8	0,936			

Source: processed data (2025)

Next, a structural analysis was conducted using SmartPLS 3, resulting in an R Square value for learning effectiveness above 0,300, indicating that the model has moderate explanatory power (Hair et al., 2019). With an R2value in the moderate category, this means that the model has fairly good predictive ability in explaining endogenous constructs. For more details, see the table below.

Table 2.
R Square Analysis Results

	R Square	**Adjusted R Square**
Learning Effectiveness	0,345	0,336
Learning Motivation	0,370	0,365

Source: processed data (2025)

The next analysis is the Effect Size analysis (f2) presented in the table below. It can be concluded that each independent variable in the model contributes differently to the dependent variable, either directly or through mediating variables.

Table 3.
Effect Size Analysis Results (f2)

	Learning Effectiveness	**Learning Motivation**
School Climate	0,050	0,586
Learning Motivation	0,170	

Source: processed data (2025)

These findings highlight the significance of learning motivation as a mediating variable in bridging the gap between the impact of school atmosphere and learning effectiveness, as seen in the above table. Both independent variables exhibit a larger impact when mediated by learning motivation, despite their very weak direct effects on learning effectiveness. As a result, learning motivation strategically contributes to the improvement of the link between student learning effectiveness and school climate.

For the endogenous variables examined, the structural model created in this study shows strong predictive potential, according to the Stone-Geisser's Coefficient (Q2) test results. The blindfolding technique is used to determine the Q(2) coefficient, which is in line with Hair et al. (2021) criteria that state that a Q(2) value greater than zero implies that the model has predictive relevance. The table below provides additional specific information about the Stone-Geisser's Coefficient (Q(2)) test results.

Table 4.
Stone-Geisser's Coefficient (Q2)

Variable	SSO	SSE	Q^2 (=1-SSE/SS0)
Learning Effectiveness	1152,000	812,442	0,295
School Climate	1728,000	1728,000	
Learning Motivation	1440,000	1050,514	0,2270

Source: processed data (2025)

To further clarify the relationship between the research variables, see the SEM model below.

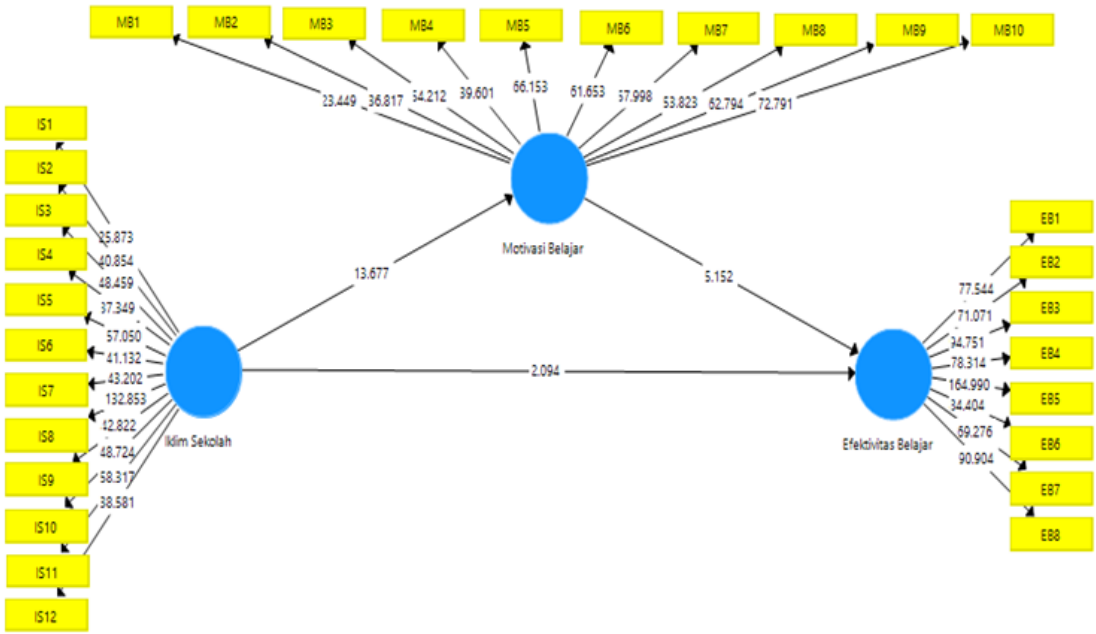

Figure 1.
SEM Output

The structural model above shows the relationship between variables in this study, reflecting the structure of direct and indirect relationships between latent constructs. The direct influence path can be seen from the relationship between school climate and learning effectiveness. Meanwhile, the indirect path is manifested through the influence of school climate on learning effectiveness mediated by learning motivation. The next step was to test the research hypotheses with the following results:

Table 5.
Research Results

Hypothesis	Statistical Hypothesis	Specific Indirect Effect	t-statistic	p-value	Test Results
School climate has a positive effect on learning effectiveness	H_0 : β= 0 H_1 : β≠ 0		2,179	0,030	H_0 rejected and H_1 accepted

School climate affects learning motivation	H_0 : β= 0 H_1 : β≠ 0		13,027	0,000	H_0 rejected and H_1 accepted
Learning motivation affects learning effectiveness	H_0 : β= 0 H_1 : β≠ 0		5,048	0,000	H_0 rejected and H_1 accepted
Learning motivation mediates the relationship between school climate and learning effectiveness	H_0 : β= 0 H_1 : β≠ 0	0,256	4,574	0,000	$H_0$is rejected and $H_1$is accepted

Source: processed data (2025)

Based on the table above:

1. A t-statistic value of 2,179 and a p-value of 0,030 were obtained from hypothesis testing about the relationship between school climate and learning effectiveness. The p-value is below the significance level of 5% (0,05), and the t-statistic value is higher than the critical limit of 1,96. As a result, the alternative hypothesis H1 is supported and the null hypothesis H0, according to which the school atmosphere has no bearing on the efficacy of learning, is rejected. This demonstrates that the efficacy of learning is positively and significantly impacted by the school climate.
2. A hypothesis test on how school climate affects learning motivation yielded a t-statistic value of 13,027 and a p-value of zero thousand. The p-value is below the significance level of 5% (0,05), and the t-statistic value is higher than the critical limit of 1,96. As a result, the alternative hypothesis H1 is supported and the null hypothesis H0, according to which school climate has no influence on learning motivation, is rejected. This suggests that learning motivation is positively and significantly impacted by the school climate.
3. Testing the hypothesis that learning motivation affects learning efficacy, the t-statistic value was 5,048 and the p-value was zero thousand. The p-value is below the significance level of 5% (0,05), and the t-statistic value is higher than the critical limit of 1,96. As a result, the alternative hypothesis H1 is supported and the null hypothesis H0, according to which learning motivation has no bearing on learning efficacy, is rejected. This suggests that learning efficacy is positively and significantly impacted by learning motivation.
4. The results of the hypothesis testing about the mediating function of learning motivation in mediating the association between learning effectiveness and school climate were noteworthy. The findings revealed a p-value of 0000, a t-statistic of 4,574, and a coefficient value of 0,256. The alternative hypothesis, H1, was accepted, and the null hypothesis, H0, which states that learning motivation does not significantly mediate the effect of school climate on learning effectiveness, was rejected because the t-statistic value obtained exceeded the critical limit of 1,96 and the p-value was less than the significance level of 0.05 (5%). This suggests that the relationship between school atmosphere and learning effectiveness is strongly mediated by learning motivation.

Discussion

Overall, the study's findings demonstrate that school atmosphere significantly and favorably affects learning efficacy, both directly and indirectly through motivation for learning. These results support the Self-Determination Theory framework (Deci & Ryan, 1985; Ryan & Deci, 2020), which highlights the significance of a learning environment that can meet students' three fundamental psychological needs autonomy, competence, and relatedness as the framework for the development of intrinsic motivation, which in turn influences learning outcomes. Students will study more effectively if they have a more positive opinion of the school climate, according to the t-statistic value of 2,179 and the p-value of 0,030. This confirms that a safe, supportive, and fair school environment is an important prerequisite for creating an effective learning process. These findings are consistent with those of Bear et al. (2020) and Wang & Degol (2016), who found that improved school atmosphere directly affects student learning outcomes and academic participation.

A conducive school climate creates a learning atmosphere that supports students' focus and cognitive engagement. When students feel physically and emotionally safe and receive support from teachers and peers, they tend to be more open to learning (Thapa et al., 2013; Zullig et al., 2020). When we relate this to the conditions at Public High School 1 Cipeundeuy, these results confirm that the school's efforts to strengthen the dimensions of rules, norms, and learning support can contribute significantly to the achievement of learning objectives. The results of this study also confirm the findings of Rahmawati (2021) and Ramdani & Kurniawan (2022), which state that a positive perception of the school climate is associated with higher learning enthusiasm and academic engagement, while reducing negative behaviors such as absenteeism and conflicts between students.

The results of the second hypothesis test show that the school climate also has a strong influence on student learning motivation with a t value of 13,027 and a p value of 0,000. This highly significant coefficient indicates that the school environment plays a major role in building students' intrinsic motivation. This is in line with Self-Determination Theory, which explains that social and academic support from teachers and healthy interpersonal relationships will strengthen students' sense of competence and connectedness (Ryan & Deci, 2017). Research by Jang, Kim, & Reeve (2021) and Chen, Wang, & Lin (2021) supports these findings by showing that when students feel autonomy and support from their environment, their intrinsic motivation and engagement in learning increase significantly. The same results were also reported by Putra & Wibowo (2022), whose research found that positive perceptions of the school atmosphere correlate with increased interest and participation in learning.

The next finding in the third hypothesis test shows that learning motivation has a positive and significant effect on learning effectiveness with a t value of 5,048 and a p value of 0,000. This means that motivation is a determining factor in building an effective learning process. Students who are highly motivated tend to be more diligent, focused, and active in learning activities, thereby achieving more optimal academic results. These results are consistent with previous studies by Schunk et al. (2014) and Slavin (2020), which state that motivation is a major determinant in improving learning effectiveness. In addition, research by Litalien et al. (2022) and Khine & Areepattamannil (2023) also shows that students with high intrinsic motivation demonstrate better learning performance, academic persistence, and higher attendance rates compared to students with low motivation. In the context of public high school, this means that teachers' efforts to facilitate autonomy needs, provide constructive feedback, and build positive interpersonal relationships can encourage student learning effectiveness.

Additional path analysis on the mediating role of learning motivation reveals that, with a specific indirect effect value = 0,256, where the t-value = 4.574 and the p-value = 0000, learning motivation significantly mediates the relationship between school climate and learning effectiveness. These results show that school atmosphere affects learning effectiveness directly as well as indirectly by raising student motivation for learning. Partial mediation is the type of mediation that was discovered, which means that while learning motivation serves as a link to improve the relationship between school climate and learning effectiveness, school climate still has a major direct impact on learning effectiveness. The study's findings are consistent with the Self-Determination Theory, which holds that school environment serves as a social setting that fosters the development of intrinsic drive, which in turn influences academic performance (Deci & Ryan, 1985; Ryan & Deci, 2020). These findings also support earlier studies by Niehaus, Rudasill, & Rakes (2012) and Diseth & Samdal (2021), which discovered that students' degree of learning motivation mediates the favorable association between school climate and learning achievement.

CONCLUSION

The efficacy of student learning is positively and significantly impacted by the school climate, according to the findings of a study conducted at public high school in Subang Regency. Students' learning effectiveness increases with their positive evaluations of a secure, welcoming, and encouraging school environment. Furthermore, learning motivation is significantly impacted by school climate, demonstrating that a supportive learning environment can promote intrinsic motivation by meeting students' core psychological requirements for relatedness, competence, and autonomy. The relationship between school atmosphere and learning effectiveness is significantly mediated by learning motivation, which has been shown to have a beneficial impact on learning effectiveness. Therefore, it can be said that a favorable school atmosphere has a significant impact on students' learning effectiveness, both directly and indirectly, by raising their motivation to learn.

It is advised that schools enhance policies that concentrate on enhancing the quality of the school climate through a good culture, equitable regulations, and a physically and emotionally secure setting in light of the study's findings. Principals can initiate school climate improvement programs that involve the participation of the entire school community. Teachers are expected to create a pleasant learning atmosphere, support student autonomy and competence, and provide constructive feedback to foster learning motivation. Similarly, students need to develop intrinsic motivation through self-determined learning to foster independent learning awareness and establish positive relationships with teachers and peers. However, policies that aim to enhance the quality of education by focusing on school atmosphere and learning motivation, such as the creation of leadership training and teacher professionalism, can be founded on the findings of this study. Further research is recommended in a broader school context by adding variables such as teacher support, academic self-efficacy, or student engagement to make the conceptual model more comprehensive.

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