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OPTIMIZING THE IMPACT OF LEARNING ENVIRONMENT ON STUDENT ACHIEVEMENT: THE MEDIATING ROLE OF INTERPERSONAL COMMUNICATION SKILLS

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ABSTRACT

Phenomenon/Issue: *The utilization gap in educational facilities is a crucial issue in higher education, where the availability of adequate learning environments often does not correlate linearly with improvements in student academic achievement.*
Purpose: *This study aims to investigate the causal mechanism of the learning environment's influence on student achievement by examining the role of interpersonal communication skills as a mediating variable.*
Novelty: *The novelty of this study lies in the empirical evidence of the vital role of communication soft skills in bridging the relationship between physical facilities and academic performance, which has often been considered directly related.*
Research Methods: *Using an explanatory quantitative design, this study involved a census population of 192 Office Administration Education students at Surabaya State University. Data were analyzed using Structural Equation Modeling (SEM-PLS).*
Results: *The test results show that the learning environment does not have a significant direct effect on student achievement. However, the learning environment has been proven to have a significant positive effect on communication skills, which in turn has a significant impact on achievement. Path analysis confirms that interpersonal communication skills act as a full mediator.*
Research Contributions: *This study implies that the existence of physical facilities and a conducive campus environment is not enough to boost academic achievement without effective communication activities. Therefore, higher education institutions must shift their strategy from merely providing infrastructure to designing interactive learning methods that require student collaboration to optimize learning outcomes.*

INTRODUCTION

Student learning achievement is a vital indicator that not only determines individual success in securing future careers and further education, but also serves as the main benchmark for the credibility and quality of educational institutions in the eyes of the public. However, this high academic achievement is a complex phenomenon that does not stand alone, but is the result of the accumulation of interactions between various systemic, social, and psychological factors. From a global perspective, variations in

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student academic achievement are largely determined by differences in the quality of education systems and teacher competence (Woessmann, 2016), and are often exacerbated by socio-economic disparities and family educational backgrounds that create inequalities in learning opportunities (Hung et al., 2020). Although external factors and structural support play a major role, research emphasizes that academic success actually depends heavily on the internal dynamics of the students themselves; self-efficacy and emotional engagement have been shown to have a strong reciprocal relationship with achievement, where belief in one's own abilities is a major predictor of student success in school (Olivier et al., 2019). Furthermore, internal drives in the form of learning motivation were also found to have a significant effect on student performance, especially when supported by blended learning methods relevant to the digital era (Rafiola et al., 2020). Interestingly, the formation of self-efficacy and motivation is greatly influenced by students' perceptions of the school climate and the quality of the social relationships they build, which implicitly confirms that a conducive learning environment and students' interpersonal communication skills in establishing interactions are crucial foundations that support optimal academic achievement (Zysberg & Schwabsky, 2020).

Contemporary academic discourse consistently postulates that superior student achievement is the result of synergy between a supportive learning ecosystem and strong interpersonal communication skills. Referring to external dimensions, Gaisey et al. (2025) and Supratno et al. (2021) provide empirical evidence that a conducive learning environment, both physically and psychosocially, is linearly correlated with improved academic performance. The depth of this influence is elaborated by Bonem et al. (2020), who assert that the quality of interactions in an environment that supports student autonomy has a more substantial impact on learning outcomes than simply varying instructional techniques, a perspective reinforced by the findings of Malik & Rizvi (2018) regarding the significance of students' positive perceptions of the classroom atmosphere. However, the effectiveness of this environment is not deterministic but requires active agency from students through interpersonal communication skills. In this context, Abid et al. (2022), through a large-scale study, confirmed a significant positive association between interpersonal competence and academic success. This mechanism of influence is comprehensively explained by Suryana & Permana (2025), where communication skills serve as a catalyst that facilitates vertical interaction with lecturers and horizontal collaboration with peers, which ultimately has a direct and tangible impact on learning outcomes, as validated by Sukarna (2021) in vocational education.

However, real problems are still found in the field. Based on initial observations of students in the Office Administration Education Study Program at Surabaya State University, a striking imbalance in achievement was found, rooted in their environmental conditions and social competencies. The data shows that groups of students who are supported by a conducive learning environment and have active and fluid interpersonal communication skills are able to achieve outstanding academic results with a GPA of 3.9. Conversely, students who lack environmental support and tend to be passive in their interactions are stuck at a GPA of 3.6. Ironically, this competency gap occurs even though the curriculum has equipped them with specific courses such as Business Communication and Interpersonal Communication. This fact reveals an empirical anomaly: even though communication theory has been formally taught, many students are still unable to internalize and practice it in their daily academic lives. The failure to transform classroom knowledge into practical skills, coupled with variations in learning environment support, is at the heart of the problem of why student academic achievement is uneven.

Responding to this empirical gap, this study was designed to examine the determinants of student achievement through the lens of Social Cognitive Theory (SCT), which postulates that individual success does not arise in a vacuum, but is the result of dynamic interactions between environmental, personal, and behavioral factors. Referring to the triadic reciprocal determinism framework elaborated by Schunk & DiBenedetto (2019), this research strategy focuses on examining the extent to which the learning environment functions as an external stimulus that positively impacts achievement improvement, while also analyzing the vital role of interpersonal communication skills as a personal capacity that strengthens these relationships. This approach is reinforced by the perspective of Peng & Kievit (2020), who assert that academic development is bidirectional; that is, high-quality instruction

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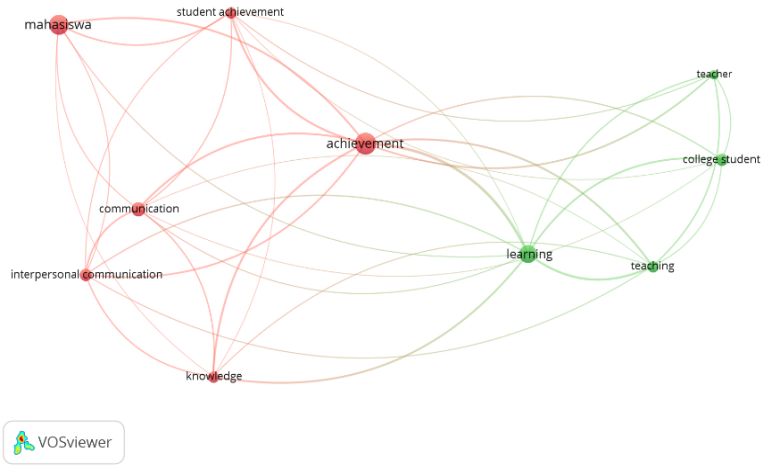
or educational environments will only produce optimal achievement if they are met with adequate cognitive and social readiness on the part of students. Thus, this study seeks to prove that the synergy between a conducive learning environment (environmental factor) and effective communication skills (personal factor) is an absolute prerequisite for producing consistent high-achieving behavior among students.



Source: processed by researcher (2025)
Figure 1. VOSVIWER ANALYSIS

A bibliometric analysis of 200 reputable journal articles reveals a fundamental research gap, whereby clusters of discussion on learning environments and interpersonal communication tend to stand alone and are not yet integrated in predicting student achievement. Responding to these limitations in the literature, this study offers something new through the development of an integrative model that examines the synergy of these two variables under the umbrella of Social Cognitive Theory. This approach not only treats communication skills as an ordinary variable, but as a vital personal capacity that acts as a bridge between the influence of the external environment and academic achievement. The urgency of this study is particularly relevant for students of the Office Administration Education Study Program at Surabaya State University, who are required to have high adaptability amid global competition. The effort to produce graduates who are not only intellectually intelligent but also socially mature is in line with the national vision of Asta Cita Indonesia Emas 2045, particularly in developing superior human resources and mastery of science and technology. Thus, the findings of this study are expected to provide strategic contributions to Surabaya State University and other universities as a reference in designing a more holistic curriculum and learning ecosystem, where the strengthening of physical facilities goes hand in hand with the development of communication soft skills to ensure the quality of highly competitive graduates.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Social Cognitive Theory

As its main foundation, this study is based on Social Cognitive Theory (SCT) popularized by Bandura (2001). This theory offers a deep yet very human perspective on the learning process, in which a person's success is not seen as a one-way event, but rather the result of a dynamic, uninterrupted dialogue between three key elements, namely behavior, internal personal factors such as cognition and feelings, and the surrounding environment. This concept of interaction is known as triadic reciprocal determinism. Schunk & DiBenedetto (2019) explain that in the lens of SCT, human motivation and achievement do not suddenly appear out of thin air, but are shaped through a reciprocal process in which

individuals actively respond to and interpret their environmental stimuli using their internal capacities. This view is further enriched by the thinking of Peng & Kievit (2020), who emphasize the bidirectional or two-way nature of cognitive development. This means that external support and internal abilities actually complement and reinforce each other continuously to form the qualities of a whole individual.

Learning Environment

The learning environment is conceptualized as a multidimensional ecosystem that is not limited to physical space alone, but also includes dynamic interactions between material, psychosocial, and academic climate aspects that collectively shape students' cognitive experiences (Gaisey et al., 2025; Munira et al., 2024). In its operationalization, this variable is divided into three fundamental dimensions that are interrelated. First, the physical aspect, which refers to Islamiyah (2019) view, focuses on the condition of instructional facilities and infrastructure, where the availability of adequate facilities such as supporting technology, air circulation, lighting, and ergonomic room layout, plays a crucial role in creating physiological comfort to maintain student concentration (Santoso & Oktafien, 2018). Second, the psychological aspect elaborated by Olivier et al. (2019) emphasizes the mental and emotional stability of learners. This dimension requires a sense of security, affective support from peers, and motivational encouragement from lecturers to build self-confidence, a perspective reinforced by (Bonem et al., 2020), who state that psychological autonomy support has a more significant impact on achievement than teaching techniques alone. Third, the academic atmosphere, as described by Zysberg & Schwabsky (2020), represents a lively learning climate created by intensive interaction patterns. The main characteristics of this dimension are seen in a campus environment that stimulates intellectual enthusiasm and facilitates active student involvement in scientific dialectics such as critical discussions and seminars, which are key indicators of healthy academic vitality according to Malik & Rizvi (2018).

Student Achievement

Conceptually, academic achievement is defined as a level of success that reflects the extent to which educational goals have been achieved by students, both in the short and long term, which is closely related to individual learning abilities and self-confidence (Laelah & Maisa, 2023). In the higher education ecosystem, the concrete manifestation of this achievement is not only seen as an abstract concept, but is operationalized through quantitative and measurable dimensions. The first fundamental dimension is the Grade Point Average (GPA), which, according to Mona & Yunita (2021), remains the primary indicator due to its objectivity in capturing overall academic achievement. This is reinforced by the view of Aditya & Malik (2022), who assess GPA as a reflection of the consistency of learning efforts and the effectiveness of the educational process, measured through semester grades and the stability of course grades. However, this achievement is supported by a second dimension, namely academic discipline, which requires students to comply with time management, such as punctuality and assignment submission, as a form of self-control that is crucial for academic success. Furthermore, the dimension of academic participation is a dynamic element that refers to Student Involvement Theory, where active student involvement in class discussions and scientific forums is believed to deepen understanding of the material and boost learning motivation. The quality of these achievements ultimately culminates in the dimension of mastery of material and application, the highest cognitive level where students are not only required to understand theory textually, but must also be able to implement this knowledge in the context of practical tasks and relevant real-life situations.

Interpersonal Communication Skills

In the landscape of higher education, interpersonal communication skills are understood as essential soft skills that bridge students' adaptation to the lecture environment, where deficiencies in these skills have been empirically proven to hinder academic achievement (Dwi Ariyani & Hadiani, 2020). Zainuddin et al. (2020) emphasize that because the essence of learning is interaction, communication plays a vital role in facilitating the direct exchange of ideas and emotions to prevent misunderstandings or counterproductive social conflicts (Hermawan et al., 2020). To measure the effectiveness of these

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interactions, Santoso & Oktafien (2018), along with Singamurti & Anggraini (2022) and Sitorus (2023), mapped out four key dimensions that are integrated with each other. The first dimension is listening skills, which require individuals to give their full attention and respond appropriately to messages without interrupting the speaker. The second dimension is speaking skills, which reflect the level of confidence and clear articulation when students present arguments or ask questions in class. Furthermore, the dimensions of empathy and responsiveness are present as emotional sensitivity to understand the feelings of discussion partners and provide relevant responses. This communication quality is complemented by the last dimension, namely the ability to build relationships, which is an indicator of students' ability to create fluid and comfortable constructive relationships, both with lecturers and fellow students in group work dynamics.

Hypothesis Development

The learning environment occupies a central position as an external determinant that influences student academic success. Various empirical studies, such as those conducted by Hermawan et al. (2020) and Takrim & Mikkael (2020), consistently prove that a conducive learning environment has a positive and significant effect on improving academic achievement. This mechanism of influence is explained in more depth by Kassab et al. (2024), who found that students' positive perceptions of the educational atmosphere, both physical and psychosocial, directly boost their cognitive and emotional engagement, which ultimately leads to higher Grade Point Average (GPA) achievements. These findings are reinforced by a study by Aditya & Malik (2022), which confirms a real correlation between the quality of the learning environment and student academic performance, where a comfortable environment minimizes external barriers and facilitates better focus on learning. Based on this theoretical and empirical foundation, the hypothesis proposed is:

H1: Learning Environment has a positive effect on Student Achievement

The learning environment serves more than just a physical space for knowledge transfer; it is a dynamic social laboratory that fundamentally shapes students' interaction competencies. Sabarudin et al. (2024) found that a supportive higher education environment provides a crucial stage for adolescents to reflect on themselves and hone their communication skills through intense academic interactions. This finding is reinforced by Lubis & Maemonah (2025), who prove that a collaborative and inclusive learning environment significantly improves students' social communication skills, as the sense of security in such an environment encourages the courage to initiate dialogue. Conversely, Mona & Yunita (2021) highlights that environments with structural barriers or rigid interaction patterns actually limit the development of interpersonal communication, emphasizing that an open environment design is an absolute prerequisite for the growth of these soft skills. Based on the argument that a conducive environment stimulates interaction and reduces social anxiety (Munif et al., 2025), the hypothesis proposed is:

H2: Learning Environment has a positive effect on Interpersonal Communication Skills

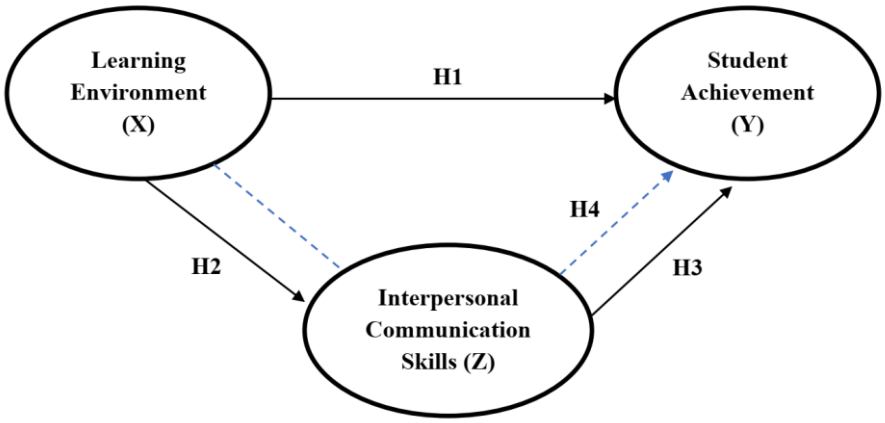
Interpersonal communication skills play a strategic role as an intellectual modality that enables students to transform their potential into concrete academic achievements. Abid et al. (2022), through their comprehensive study, emphasize that this social navigation ability is strongly correlated with achievement because students who are skilled in communication tend to be more proactive in seeking learning resources and solving academic problems. This is further explored by Suryana & Permana (2025), who found that effective communication, both vertically with lecturers and horizontally with peers, functions as a catalyst that minimizes material ambiguity and increases learning motivation through productive project collaboration. Strong empirical support also comes from Sukarna (2021), who proves that there is a significant direct influence between interpersonal competence and learning outcomes, where communicative students have more precise information absorption and sharper articulation of ideas. These findings are further reinforced by recent research from Hikaya et al. (2024) and Laelah & Maisa (2023), which specifically shows that students with good interpersonal skills have

higher academic adaptability, which directly impacts their Grade Point Average (GPA). Based on the premise that communication is a cognitive bridge in the learning process, the hypothesis proposed is:

H3: Interpersonal Communication Skills have a positive effect on Student Achievement

Conceptually, the influence of the learning environment on student academic achievement does not only work through direct channels but also occurs through psychosocial mediation mechanisms involving interpersonal communication skills. A well-designed learning environment, both physically and in terms of a supportive academic climate, as described by Han & Xu (2025) and Kassab et al. (2024), serves as a catalyst that reduces social anxiety and stimulates students' courage to interact. When students feel supported by their environment, their interpersonal communication skills, such as the ability to ask questions, discuss, and build relationships with lecturers and peers, will develop optimally, according to Sabarudin et al. (2024). It is this improvement in the quality of communicative interaction that then becomes a vital bridge for mastering teaching materials. As proven by Raditya et al. (2023) and Abid et al. (2022), students with strong communication skills tend to be more active in academic collaboration and find it easier to solve learning difficulties, which ultimately leads to improved academic achievement. Thus, interpersonal communication skills act as an intervening variable that absorbs positive energy from the learning environment and transmits it into tangible achievements. Based on this explanation, the hypothesis proposed is:

H4: Learning Environment has a positive indirect effect on Student Achievement through the mediation of Interpersonal Communication Skills



Source: processed by researcher (2025)
Figure 2. RESEARCH DESIGN

METHOD

This study uses a quantitative approach with explanatory research to explain the causal relationship between variables through hypothesis testing (Creswell & Creswell, 2018). The research subjects included all active students enrolled in the 2023 Office Administration Education Study Program at Surabaya State University for the 2024/2025 academic year. Given the urgency of comprehensive data representation, a saturated sampling or census technique was applied so that the total population of 192 students was drawn entirely as a research sample without exception. Data collection was conducted using an online questionnaire via Google Form with a Likert scale measurement covering 9 items for the learning environment variable, 8 items for student achievement, and 12 items for interpersonal communication skills. The empirical data collected from the 192 respondents was then processed using the Structural Equation Modeling - Partial Least Squares (SEM-PLS) method with the assistance of SmartPLS version 3.0 software, which was chosen for its ability to handle complex models with high precision. The analysis procedure was carried out in stages, starting with the evaluation of the measurement model or outer model to ensure convergent validity, discriminant validity, reliability, and

VIF values of the instruments, followed by the evaluation of the structural model or inner model, which included path coefficient analysis for hypothesis testing, R-square, and Q^2 predictive relevance to validate the predictive power and relevance of the model (Jr. et al., 2021).

RESULTS AND DISCUSSIONS

This study involved 192 active students of the Office Administration Education Study Program at the Faculty of Economics and Business, Surabaya State University, class of 2023, who were enrolled in the 2024/2025 academic year. Table 1 shows a description of the characteristics of the respondents categorized by gender and class.

Table 1.
RESPONDENT CHARACTERISTICS

Characteristics	Respondent	Frequency	%
Gender	Male	25	13,02%
	Female	167	86,98%
	Total	**192**	**100%**
Class	PAP 2023 A	22	11,46%
	PAP 2023 B	22	11,46%
	PAP 2023 C	22	11,46%
	PAP 2023 D	21	10,94%
	PAP 2023 E	21	10,94%
	PAP 2023 F	21	10,94%
	PAP 2023 G	21	10,94%
	PAP 2023 H	21	10,94%
	PAP 2023 I	21	10,94%
	Total	**192**	**100%**

Source: processed by researcher (2025)

Measurement Model Evaluation

The evaluation of the outer model involves measuring convergent validity, discriminant validity, and reliability to measure sample data that can describe the construct accurately and consistently. Convergent validity is measured through loading factors greater than 0.60 and Average Variance Extracted (AVE) values above 0.50 (Hair et al., 2014). Discriminant validity testing is considered to have been met if the AVE root value for each construct is greater than the values for other constructs. This value can be reviewed through the Fornell-Larcker approach. Meanwhile, reliability testing can be identified through the Composite Reliability (CR) and Cronbach's Alpha (CA) results, with each value requirement > 0.70 (Fornell & Larcker, 1981; Suprapto et al., 2025).

Table 2.
VALIDITY, RELIABILITY, AND VIF RESULTS

Constructs	Indicators	Loading Factors	CR	AVE	CA	VIF
Learning Environment			0.875	0.502	0.834	
	X.2	0.612				1.352
	X.4	0.722				1.577

Constructs	Indicators	Loading Factors	CR	AVE	CA	VIF
	X.5	0.751				1.771
	X.6	0.749				1.676
	X.7	0.750				1.765
	X.8	0.704				1.501
	X.9	0.659				1.383
Student Achievement			0.879	0.512	0.842	
	Y.1	0.630				1.411
	Y.3	0.618				1.724
	Y.4	0.728				1.973
	Y.5	0.733				1.681
	Y.6	0.681				1.582
	Y.7	0.801				2.047
	Y.8	0.795				2.000
Interpersonal Communication Skills			0.892	0.508	0.861	
	Z.4	0.721				1.860
	Z.5	0.729				1.871
	Z.6	0.719				1.767
	Z.7	0.627				1.404
	Z.8	0.680				1.603
	Z.10	0.754				1.819
	Z.11	0.748				1.937
	Z.12	0.715				1.643

Source: PLS-SEM (2025)

Based on Table 2, the results of convergent validity through loading factors show that 22 of the 29 items from all constructs have valid data with a range of 0.612–0.801 > 0.60. Meanwhile, the other 7 items were eliminated because they did not meet the validity requirements. Then, the AVE values of the three constructs have reached values above 0.50, which supports the validity results of the items that have been tested well. Furthermore, the reliability test results in Table 2 reveal that the CR values for each construct have met the test requirements of > 0.70, thus the data has a good level of reliability. Reliability measurements through CA also indicate values in the range of 0.834–0.861, which exceed 0.70.

Table 2 also shows the results of multicollinearity testing through VIF analysis, which measures the potential for collinearity between two constructs. The ideal VIF value is < 3 (Hair et al., 2014). The higher the VIF value in a construct relationship, the more it can affect the model's predictive ability in describing the correlation between other constructs. Based on the results, it is known that the VIF of each construct item does not exceed 3, so the research data is declared to have no potential for collinearity. Then, the discriminant validity results can be seen using the Fornell-Larcker approach presented in Table 3. It can be seen that the AVE root value in the Interpersonal Communication Skills (Z) construct is higher than the AVE root value of the Z construct in relation to other constructs. The AVE root values for constructs X and Y also show similar results, indicating that all constructs have achieved discriminant validity in accordance with the requirements.

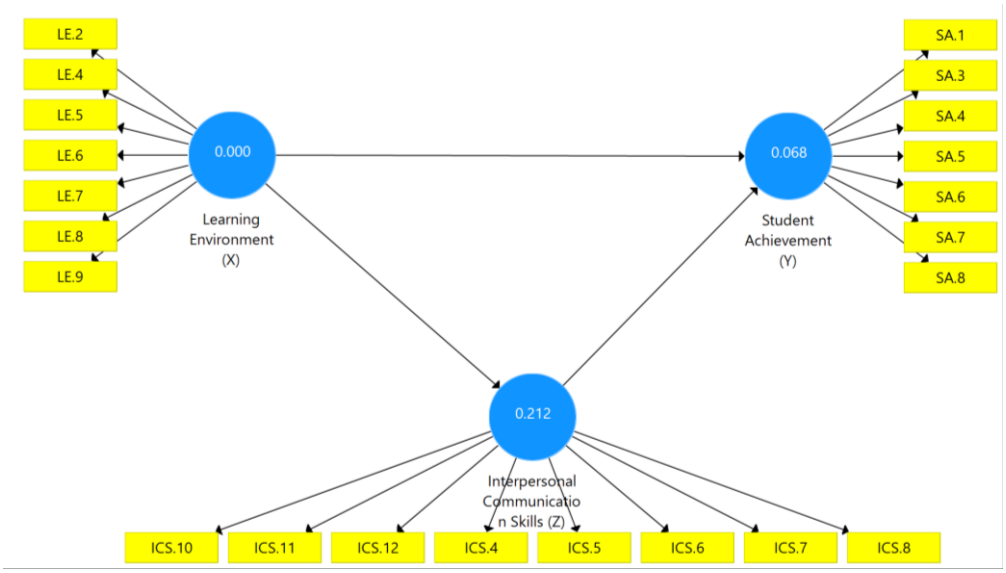
Table 3.
FORNELL-LARCKER RESULTS

	Z	X	Y
Z	**0.713**		
X	0.659	**0.708**	
Y	0.384	0.315	**0.715**

Source: PLS-SEM (2025)

Structural Model Evaluation

This study further evaluates the inner model that analyzes the structural relationship between constructs through bootstrapping (see Figure 3). The inner model evaluation includes testing r-square, Q^2 predictive relevance, and path coefficients. The R-square test is intended to analyze how well the exogenous constructs are able to explain the endogenous constructs in the structural model. A higher R-square value indicates a strong relationship between constructs, while a weak relationship between constructs is indicated by a low R-square value. The Q^2 predictive relevance test is used as a measure to predict the relevance of a construct in the research model. A Q^2 value greater than 0 is considered good (Hair et al., 2019).



Source: SEM-PLS (2025)
Figure 3. BOOTSTRAPPING TEST

The results of the R-square and Q^2 tests are shown in Table 4. The relationship between Learning Environment and Student Achievement has an explanatory power of 0.145, meaning that Learning Environment can explain 14.5% of the variance in the Student Achievement construct. Meanwhile, Interpersonal Communication Skills can be explained by Learning Environment by 0.431 or 43.1%, while 56.9% is explained by external factors outside the study. Then, the Q^2 value of the endogenous and mediation constructs has a predictive value of more than 0, indicating that Learning Environment is relevant when used as a predictor of constructs Y and Z.

Table 4.
R-SQUARE AND Q^2 PREDICTIVE RELEVANCE RESULTS

Constructs	R-square Value	Q^2 Predictive Relevance
Student Achievement	0.145	0.068
Interpersonal Communication Skills	0.431	0.212

Source: PLS-SEM (2025)

Path coefficient tests were conducted to analyze the relationship between constructs with a significance level of 0.05. Based on the findings in Table 5, the hypothesis was accepted if it had a significant and positive relationship with a p-value < 0.05 and a positive coefficient value. A total of 192 respondents were analyzed, showing that the dominance hypothesis was accepted with a significant positive relationship.

Table 5.
HYPOTHESES TEST RESULTS

Constructs	Coefficient	T-statistics	p-values	Description
Direct Effects				
X → Y	0.110	1.177	0.240	H1 not supported
X → Z	0.659	10.161	0.000	H2 supported
Z → Y	0.312	3.396	0.001	H3 supported
Indirect Effects				
X → Z → Y	0.205	2.966	0.003	H4 supported

Source: PLS-SEM (2025)

The Learning Environment shows a positive effect on Student Achievement with a coefficient value of 0.110, but it is not significant with p-values of 0.240 > 0.05. Thus, H1 is rejected. This is in contrast to the relationship between Learning Environment and Interpersonal Communication Skills, which shows a significant and positive relationship with a coefficient value of 0.659 and a p-value of 0.000, which is less than 0.05. Therefore, H2 is accepted. The analysis of path coefficients from the last direct effects, namely between Interpersonal Communication Skills and Student Achievement. This relationship was found to be positive and significant with a coefficient value of 0.312 and a p-value of 0.001 < 0.05, so H3 was accepted. Furthermore, the indirect effects test of Learning Environment on Student Achievement through the mediation of Interpersonal Communication Skills showed positive and significant results with a coefficient value of 0.205 and a p-value of 0.003 < 0.05, therefore it can be concluded that H4 is accepted.

The Influence of Learning Environment on Student Achievement

The results of statistical testing on the first hypothesis reveal an interesting empirical reality in which the learning environment variable was found to have no significant effect on student academic achievement, with p-values of 0.240, which is well above the significance threshold of 0.05. This finding indicates that for students enrolled in 2023, the availability of complete physical facilities and a conducive campus atmosphere did not necessarily translate into high Grade Point Average (GPA) achievements. This phenomenon of insignificance can be explained precisely through the lens of Albert Bandura's Social Cognitive Theory, which postulates the concept of Triadic Reciprocal Determinism. In this theoretical perspective, environmental factors are merely passive providers of external resources and do not have the coercive power to directly dictate behavior without going through the cognitive filtering process and internal motivation from within the individual, or personal factors. This means that campus facilities are merely inanimate objects that will have no impact if students do not have the agency to utilize them.

This theoretical interpretation is in line with the latest research findings from Mahiza & Nurhidayati (2025) and Mauliddiyah & Wulandari (2022), which consistently found that learning facilities and the campus environment do not have a significant effect on learning outcomes if they are not accompanied

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by strong discipline and intrinsic motivation. This reinforces the existence of a utilization gap, where students may feel comfortable being on campus to socialize, but this comfort is not utilized for productive activities that support their academics. In line with this, Mubarak & Krisnanda (2019) also prove that differences in classroom environment quality do not have a distinguishing impact on student exam results because the main determining factor remains the students' self-regulation. Therefore, in order for investment in educational facilities not to be wasted, future higher education strategies must not stop at the stage of providing facilities alone but must move on to the social engineering of learning. Lecturers and campus management need to design participatory learning methods such as Project-Based Learning, which requires students to interact intensively with laboratory or library facilities so that the learning environment transforms from a mere physical backdrop into an active catalyst that triggers achievement.

The Influence of Learning Environment on Interpersonal Communication Skills

The results of statistical testing on the second hypothesis revealed very positive and significant findings, whereby the learning environment was proven to be the main determinant in the formation of students' interpersonal communication skills, with a strong path coefficient value of 0.659 and a p-value of 0.000. This data confirms that the campus ecosystem not only functions as a space for academic knowledge transfer but also acts as a crucial social laboratory for students to hone their verbal and non-verbal competencies. In line with the findings of Sabarudin et al. (2024), a supportive higher education environment provides a stage for young people to reflect on themselves and encourages them to initiate complex interactions with lecturers and peers. From Bandura's Social Cognitive Theory perspective, this condition occurs because the environment provides behavioral models and social norms that are adopted by students through the observation process. When the academic atmosphere is designed to be inclusive, as described by Zhang (2023), psychological barriers such as communication anxiety will be reduced so that students feel safe to express their ideas and develop their interpersonal capacities authentically.

Conversely, the urgency of this environmental quality becomes even more apparent when compared to less ideal conditions. Recent research by Munif et al. (2025) shows that educational environments with rigid segregation patterns or a closed climate actually create significant communication barriers for students. Therefore, these findings have managerial implications that educational institutions must seriously engineer the social environment of the campus. Suryana & Permana (2025) as well as Lubis & Maemonah (2025) suggest that universities create dynamic spaces for interaction, both physically, such as providing open discussion areas, and pedagogically, through collaborative learning methods. This environment, rich in opportunities for interaction, has been empirically proven to accelerate students' social maturity and interpersonal negotiation skills, which are vital for their future career readiness.

The Influence of Interpersonal Communication Skills on Student Achievement

The results of statistical testing on the third hypothesis confirm that interpersonal communication skills have a significant positive contribution to student learning achievement, as indicated by a path coefficient value of 0.312 and a p-value of 0.001 (< 0.05). This finding indicates that students' ability to manage social interactions, both vertically with lecturers and horizontally with peers, serves as a strategic asset that boosts their academic achievement. Strong empirical support is found in the studies by Hikaya et al. (2024) and Sukarna (2021), which consistently prove that students with good communication skills tend to achieve higher learning outcomes. This occurs because effective communication allows students to break through comprehension barriers through active discussion and minimize psychological barriers to asking questions, so that the process of knowledge transfer from lecturers to students runs more precisely and optimally without information distortion.

This mechanism of success can be explained in more depth through the perspective of Wijaksono et al. (2024), which highlights those interpersonal skills work by increasing motivation to complete academic tasks. Communicative students have better resource-seeking abilities, where they tend to proactively seek help, references, or solutions from their social networks when facing study difficulties. This argument is reinforced by Abid et al. (2022) and additional studies by Sitorus (2023), which found that

harmonious interpersonal relationships between lecturers and students create a safe psychological climate. This condition encourages students to be more involved in the learning process and have higher self-confidence in facing academic evaluations. Thus, interpersonal communication skills are not merely complementary soft skills but vital catalysts that transform cognitive potential into tangible achievements through mechanisms of collaboration and broader access to information.

The Influence of Learning Environment on Student Achievement through Mediation of Interpersonal Communication Skills

The results of the fourth hypothesis test explain that the influence of the learning environment on achievement is fully mediated by interpersonal communication skills, as indicated by an indirect effect coefficient value of 0.205 and a p-value of 0.003 (< 0.05). This data confirms that physical facilities and the academic climate of the campus do not automatically boost student grades but must first be converted into productive social interaction activities. As explained by Sabarudin et al. (2024), a conducive environment serves as an enabler that reduces social anxiety and stimulates students to be more open. When students feel comfortable with their environment, their courage to initiate communication will grow. It is this communication competency that then becomes the real driving force behind academic achievement, as found by Raditya et al. (2023), where students who actively communicate find it easier to solve study problems through discussion and collaboration.

This mechanism emphasizes that the learning process in higher education is a social phenomenon and not merely an isolated individual cognitive process. Referring to comprehensive research by Kassab et al. (2024), academic success is highly dependent on student engagement, one of the main forms of which is communicative interaction with lecturers and peers. A quality learning environment is only the stage, while communication skills are the performance. If facilities are available but students are passive (do not communicate), then achievements will not be realized. Conversely, if the environment can trigger positive perceptions, as revealed by Han & Xu (2025), which then encourages students to actively ask questions and discuss, then understanding of the material will increase significantly. Thus, the strategy for improving achievement is not enough to just build luxurious buildings but must design an ecosystem that forces intensive exchange of ideas between individuals.

CONCLUSION

Overall, this study concludes that the learning environment does not directly affect students' academic achievement but must go through the intermediary of interpersonal communication skills. This confirms that physical facilities and campus atmosphere are only supporting resources that will have a real impact on academic grades if students utilize them to build productive social interactions. Therefore, the main strategy that needs to be emphasized is a shift in the institution's focus from merely providing facilities to creating a learning ecosystem that requires active communication, such as through project-based methods or intensive group discussions. However, these findings are limited by the cross-sectional research design and the homogeneous population within a single study program. For further research, it is recommended to expand the subjects across disciplines and integrate other variables such as digital literacy or self-regulation in order to analyze the determinants of achievement more comprehensively.

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