

# The Mediating Effect of Classroom Learning Environment on the Relationship between Teaching Strategies and Student Engagement

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## ABSTRACT

Student engagement referred to the active participation and commitment a student demonstrated in their learning process. This study aimed to examine the mediating effect of the classroom learning environment in the relationship between teaching strategies and student engagement. A quantitative research design was employed, incorporating descriptive non-experimental, correlational, and mediation analysis. The study involved 309 students from a local college in Santo Tomas, Davao del Norte, selected through stratified random sampling. Data were collected using three adapted questionnaires and analyzed using mean, Pearson correlation (Pearson- $r$ ), and path analysis. The findings indicated that teaching strategies, student engagement, and the classroom learning environment were all rated highly. Additionally, the three variables showed significant correlations. Notably, the results revealed that the classroom learning environment partially mediated the relationship between teaching strategies and student engagement. This suggests that the classroom learning environment significantly influenced student engagement and played a vital role in how teaching strategies are implemented. A well-structured, supportive learning environment with access to resources and interactive teaching methods enhanced student participation and engagement in their studies.

**Keywords:** teaching strategies, classroom learning environment, student engagement, Philippines

## INTRODUCTION

Student engagement is defined as the degree to which students are emotionally, behaviorally, and cognitively involved in their learning processes (Kahu, 2023). However, the common issues related to student engagement include lack of focus, disinterest in classroom discussions, excessive use of mobile phones, and a passive approach to participation (Kumari, 2024). Additionally, disengagement is greatly influenced by a number of factors, including poor instruction, a lack of resources in the classroom, an excessive workload, and outside stressors like family responsibilities or financial hardships (Hurtado et al., 2021). Furthermore, these issues contribute to a decreased number of meaningful learning opportunities, psychological issues, and disengagement at the academic level (Aria et al., 2020).

In Australia, many university students report a lack of engagement in their learning, primarily due to large class sizes and limited opportunity for individualized time with instructors (Higher Education Standards Panel, 2017). In Mexico, poor student engagement is widely reported among higher education students due to uninspired teaching approaches. Many students describe lectures as boring and uninteresting, leading to reduced participation in class (Gonzales & Martinez, 2020). Additionally, research in Japan, shows that students usually value fitting in more than participating fully in class discussions and group projects. This social dynamic may have a significant effect on students' willingness to engage in their education (Takahashi, 2021).

In the Philippines, many university students are less engaged with their academic activities, mainly due to overcrowding in classes and a lack of personalized attention from teachers (Bautista & De Guzman, 2021). Moreover, a significant proportion of students experience disengagement with the old ways of lecturing, wherein lectures are said to be monotonous and uninteresting, which reduces the level of engagement (Ramos, 2020). In

line with the studies, there is also a disconnection between the instructor and the learner, which is said to have reduced the capacity of students to engage in active participation for learning (Del Mundo & Tan, 2022).

Many studies have been conducted at the international level to understand factors associated with student engagement. However, the researcher has not found any study that considers the classroom learning environment as a mediating factor between teaching strategies and student engagement. Hence, the researcher feels a sense of urgency to conduct this study to fill the gap in literature covering these subjects, especially in the local context. This study aims to explore the relationship between the classroom environment, teaching strategies, and student engagement, which is essential in improving the quality of education. Teachers may create better learning environments, modify their teaching strategies to fit various contexts, and raise student achievement by having a greater understanding of how these factors interact. The results can help create more effective and interesting learning experiences by supporting initiatives to keep students actively involved and better equipped for their future careers.

### Statement of the Problem

This research investigated the mediating effects of the classroom learning environment on the relationship between teaching strategies and student engagement during the academic year 2024-2025. Specifically, this study aimed to answer the following of:

1. What is the level of teaching strategies in terms of:
  - 1.1 . behavioral strategies;
  - 1.2 . cognitive strategies; and
  - 1.3 . Effective strategies?
2. What is the level of student engagement in terms of:
  - 2.1 . agentic engagement;
  - 2.2 . behavioral engagement;
  - 2.3 . emotional engagement; and
  - 2.4 . Cognitive engagement?
3. What is the level of classroom learning environment in terms of:
  - 3.1 . classroom positive;
  - 3.2 . diversity values;
  - 3.3 . personal negative; and
  - 3.4 . Persistence in major?
4. Is there a significant relationship between:
  - 4.1 . teaching strategies and student engagement?
  - 4.2. teaching strategies and classroom learning environment?
  - 4.3 . Classroom learning environment and student engagement?
5. Does classroom learning environment significantly mediate the relationship between teaching strategies and student engagement?

## Hypotheses

The following hypotheses were tested at a 0.05 level of significance.

1. There is no significant relationship between:
  - 1.1 teaching strategies and student engagement;
  - 1.2 classroom learning environment and teaching strategies; and
  - 1.3 classroom learning environment and student engagement.
2. There is no significant mediating role of classroom learning environment on the relationship between teaching strategies and student engagement.

## Theoretical Framework

This study was anchored on Constructivist Theory by Piaget (1977) & Vygotsky (1978), which posited that students learn best when they actively construct their knowledge in a dynamic and interactive environment. Constructivist teaching strategies focus on student-centered learning, the inclusion of ideas like collaboration, and inquiry-based activities. In this context, the learning environment of the classroom actuates and nurtures engagement through social and cognitive supports allowing active participation by students in the learning process. "Constructivism Learning Theory: A Paradigm for Teaching and Learning" (Tam, 2000) highlights the importance of social-collaborative-active learning as well as the role played by teachers in assisting students to discover and, in an interactive manner, create an environment that empowers them to take control over their own learning.

Through reflective practices and authentic tasks in particular, it linked these components to increased involvement (Tam, 2000). According to constructivism, students actively create knowledge via their experiences, therefore encouraging inquiry, discussion, and problem-solving in the classroom is crucial (PMC, 2021; Georgia Tech, 2023). By offering chances for group investigation, critical thinking, and idea development in social settings, this viewpoint highlights how teaching methods and learning environments have a big influence on students' engagement (Anderson et al., 2020; Johnson, 2022).

## Conceptual Framework

Presented in figure 1 is the conceptual framework of the variables of the study. The independent variable of the study were the teaching strategies with indicators of behavioral strategies, cognitive strategies, and effective strategies as indicated by Hamzeh (2014). The dependent variable is the student engagement with the following indicators of agentic engagement, behavioral engagement, emotional engagement, and cognitive engagement as indicated by Gan et al. (2024).

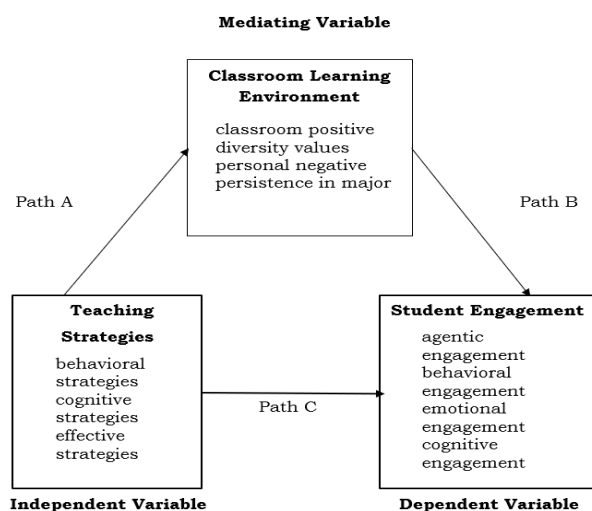


Figure 1. Conceptual Framework Showing the Variables of the Study

Moreover, the mediating variable of this study is classroom learning environment with indicators of classroom positive, diversity values, personal negative, and persistence in major as highlighted by McGhee et al. (2007).

## METHODOLOGY

In this chapter, the research methods and procedures employed by the researcher in this study were discussed. This covered the research design, the research subject, the research instrument employed, the data gathering process, and the statistical treatment of data.

### Research Design

This study utilized quantitative, descriptive, correlational research design, and mediation analysis. A quantitative approach emphasizes the collection of measurable data and its statistical analysis. It typically involved the use of tools like surveys, tests, and polls to obtain objective data for evaluation (Imoh-Ita, 2023). The descriptive approach utilized tools like surveys, interviews, and case studies to provide context about populations or conditions, serving as a foundation for exploring new areas of research (Deckert & Wilson, 2023). Correlational research examined and described existing conditions without altering or controlling variables, making it a subset of descriptive research (Pratama et al., 2023). The investigation utilized mediation analysis examines the mechanism through which an independent variable influences a dependent variable via a mediator, allowing for the assessment of direct and indirect effects in relationships (Yin et al., 2024).

This design was selected to objectively analyze the relationship between teaching strategies, classroom learning environment, and student engagement. It allowed for the collection of measurable data through surveys or observations, without altering any variables. By applying statistical analysis to these variables, we were able to identify patterns and correlations that shed light on how the classroom environment could mediate the relationship between teaching strategies and student engagement. This approach was particularly effective for describing the existing conditions and exploring the connections between these important factors.

### Research Subject

The respondents of this study were the first-year students in the local college of Santo Tomas, Davao del Norte. To determine the sample size, the researcher considered the Raosoft calculator, and from the calculation only 309 random students were selected out of 1,570 first-year population of the students. This study employed the stratified random sampling technique (SRS) which was a statistical technique that divides a population into discrete subgroups, or strata, to ensure that each subgroup has an acceptable representation in the sample. This approach improved estimated precision by lowering variance within strata relative to the whole population. SRS can be used on both static datasets and dynamic data streams, using algorithms designed to improve sample efficiency and variance control (Nguyen et al., 2021; Nguyen et al., 2019).

### Research Instrument

The researchers adapted three standardized questionnaires to assess Classroom Learning Environment, Teaching Strategies, and Student Engagement.

For the independent variable, teaching strategies, the questionnaire was adapted from the Teaching Strategies Used by Mathematics Teachers in the Jordan Public Schools and Their Relationship with Some Variables by Hamzeh (2014). For teaching strategies, there were three (3) indicators which were behavioral strategies with fourteen (14) items, cognitive strategies with twenty-one (21) items, and effective strategies with fifteen (15) items, totaling fifty (50) items. While describing teaching strategies, the following five-point Likert scale were used: 5 (Always), 4 (Often), 3 (Sometimes), 2 (Less), and 1 (Least).

Range of Means	Descriptive Level	Interpretation
4.20 - 5.00	Very High	This means that the teaching strategies are always evident.
3.40 - 4.19	High	This means that the teaching strategies are oftentimes evident.
2.60 - 3.39	Moderate	This means that the teaching strategies are sometimes evident.
1.80 - 2.59	Low	This means that the teaching strategies are seldom evident.
1.0 - 1.79	Very Low	This means that the teaching strategies are rarely evident.

For the dependent variable, student engagement, the questionnaire was adapted from the study Chain Mediating Effects of Student Engagement and Academic Achievement on University Identification by Gan et al., (2024). For student engagement, there were four (4) indicators which were agentic engagement with four (4) items, behavioral engagement with five (5) items, emotional engagement with four (4) items, and cognitive engagement with eight (8) items, totaling twenty-one (21) items. In describing the student engagement, the following five-point Likert scale were used: 5 (Always), 4 (Oftentimes), 3 (Sometimes), 2 (Less), and 1 (Least).

Range of Means	Descriptive Level	Interpretation
4.20 - 5.00	Very High	This means that student engagement is always manifested.
3.40 - 4.19	High	This means that student engagement is oftentimes manifested.
2.60 - 3.39	Moderate	This means that student engagement is sometimes manifested.
1.80 - 2.59	Low	This means that student engagement is seldom manifested.
1.0 - 1.79	Very Low	This means that student engagement is rarely manifested.

For the mediating variable, classroom learning environment, the questionnaire was adapted from the study The Classroom Learning Environment (CLE) Questionnaire: Preliminary Development by McGhee, Lowell, and Lemire (2007). For the classroom learning environment, there were four (4) indicators which were classroom positive with fourteen (14) items, diversity values with six (6) items, personal negative with four (4) items, and persistence in major with three (3) items, totaling twenty-seven (27) items. In describing the classroom learning environment, the following five-point Likert scale were used: 5 (Always), 4 (Oftentimes), 3 (Sometimes), 2 (Less), and 1 (Least).

Range of Means	Descriptive Level	Interpretation
4.20 - 5.00	Very High	This means that the classroom learning environment is always observed.
3.40 - 4.19	High	This means that the classroom learning environment is oftentimes observed.
2.60 - 3.39	Moderate	This means that the classroom learning environment is sometimes observed.
1.80 - 2.59	Low	This means that the classroom learning environment is seldom observed.
1.0 - 1.79	Very Low	This means that the classroom learning environment is rarely observed.

## Statistical Treatment of Data

The following statistical tools were used in the computation of data and testing the hypothesis at alpha 0.05 level of significance.

**Mean.** It is computed by adding up all of the values and dividing by the total number of values. It is the average value of all the numbers in the collection (Bhandari, 2020). This was used to determine the level of teaching strategies, student engagement, and classroom learning environment.

**Pearson r.** It is the most widely used method for measuring the strength and direction of the linear relationship between two variables (Turney, 2022). This was used to determine the interrelationship between teaching strategies, classroom learning environment, and student engagement.

**Path Analysis.** Is an extension of multiple regression that looks at the relationships among numerous variables by concreting on casual relationships (Awogbemi et al., 2022) This was utilized to ascertain the mediating effect of the classroom learning environment on the relationship between teaching strategies and student engagement.

## RESULTS AND DISCUSSIONS

This chapter showed data presentation, analysis, and interpretation that were predicated on the goals of the study. The order in which the following issues covered were as follows: level of teaching strategies; level of student engagement; level of classroom learning environment; correlation between teaching strategies; student engagement and classroom learning environment; mediation analysis results.

### Level of Teaching Strategies

The descriptive statistics findings on determining the level of teaching strategies were shown in table 2, which had an overall Mean of 4.10 and Standard Deviation of 0.58, described as high. This means that the teaching strategies were oftentimes evident. It was also shown in the result that Effective Strategies has the highest Mean of 4.17 and SD of 0.58 with descriptive level of high, which means that effective strategies were oftentimes evident. Moreover, Behavioral Strategies has the lowest Mean of 4.05 and SD of 0.58 with a descriptive level of high, which means behavioral strategies were oftentimes evident.

These findings implied that persistent usage of efficient teaching strategies plays a part in maintaining a favorable and interactive learning climate, increasing the understanding, critical thinking, and academic performance of students. Also, the implementation of behavioral strategies assisted in establishing positive routines and self-control in students, allowing them to remain concentrated, make better judgments, and succeed academically.

**Table 2**

*Level of teaching strategies*

Indicator	Mean	SD	Descriptive Level
Behavioral Strategies	4.05	0.58	High
Cognitive Strategies	4.08	0.58	High
Effective Strategies	4.17	0.58	High
<b>Overall</b>	<b>4.10</b>	<b>0.58</b>	<b>High</b>

The results of this study supported the findings of earlier studies highlighting the importance of behavioral, cognitive, and affective instructional methods in improving students' engagement and performance. For example, Tshering et al. (2024) illustrated that active learning approaches, such as constructivist instruction and activity-based lessons, greatly enhanced students' behavioral and cognitive involvement. On a similar note, Tumberayan et al. (2024) observed that combining both cognitive and affective strategies for language learning yields holistic learning experiences that meet both students' cognitive and affective needs. Secondly, Pizon and Ytoc (2021)

identified strategies of teaching as direct and indirect predictors of maths performance, placing their role as vital to performance. These studies as a whole affirm the value of using multiple teaching approaches to create high levels of student engagement and academic achievement.

### Level of Student Engagement

The descriptive statistics findings on determining the level of student engagement were shown in Table 3, which had an overall Mean of 4.07 and SD of 0.69, which was described as high. This means that student engagement was oftentimes evident. It also showed that Emotional Engagement has the highest Mean of 4.15 and SD of 0.68 with a high descriptive level, which means coping was oftentimes evident. Moreover, Agentic Engagement had the lowest Mean of 3.89 and SD of 0.78 with a high descriptive level, which means agentic engagement was oftentimes evident.

These results indicated that students were emotionally invested in learning, which aligns with their capacity to deal with academic pressures and remain motivated. Additionally, while agentic engagement was present, the comparatively lower score indicates that some students might have difficulty taking charge and ownership of learning, which affected their sense of responsibility, personal development, and general academic achievement.

**Table 3**

*Level of student engagement*

Indicator	Mean	SD	Descriptive Level
Agentic Engagement	3.89	0.78	High
Behavioral Engagement	4.12	0.66	High
Emotional Engagement	4.15	0.68	High
Cognitive Engagement	4.11	0.66	High
<b>Overall</b>	<b>4.07</b>	<b>0.69</b>	<b>High</b>

These findings were in line with other recent research that emphasized the importance of various dimensions of student engagement. Dahleez et al. (2021), for instance, found that the usability of e-learning systems significantly and positively contributed to students' agentic, behavioral, and cognitive engagement in higher education. The significance of emotional engagement in educational settings was also brought out by Falola et al. (2025), who revealed that emotional intelligence traits significantly influenced graduate students' academic engagement. In addition, Nair et al. (2023) brought forth the significance of emotional engagement and introduced an innovative approach to measuring students' interest levels during online classes based on facial expressions through deep learning methods. These studies indicated how crucial it is to encourage a lot of aspects of student engagement in an effort to enhance academic outcomes.

### Level of Classroom Learning Environment

The descriptive statistics findings on determining the level of classroom learning environment are shown in Table 4, which has an overall Mean of 4.08 and SD of 0.66, which was described as high. This means that the classroom learning environment was oftentimes manifested. It also showed that Classroom Positive has the highest Mean of 4.10 and SD of 0.59 with a high descriptive level, which means classroom positive was oftentimes manifested. Moreover, Persistence in Major had the lowest Mean of 4.06 and SD of 0.74 with a high descriptive level, which means that persistence in major was oftentimes manifested.

These results indicated that students find their classroom learning environment to be supportive and facilitating. The low standard deviation of 0.66 also revealed that there is a common consensus among respondents in the positive influence of an orderly classroom. A well-structured classroom helps students stay attentive, take part in activities, and grasp lessons more easily, leading to better learning and academic success.

**Table 4**

*Level of classroom learning environment*

Indicator	Mean	SD	Descriptive Level
Classroom Positive	4.10	0.59	High
Diversity Values	4.09	0.65	High
Personal Negative	4.08	0.65	High
Persistence in Major	4.06	0.74	High
<b>Overall</b>	<b>4.08</b>	<b>0.66</b>	<b>High</b>

**Table 4**

*Level of coping strategies*

Indicator	Mean	SD	Descriptive Level
Cognitive reappraisal	4.21	0.67	Very High
Social support	4.14	0.79	High
Problem-solving	4.31	0.63	Very High
Religiosity	4.51	0.69	Very High
Tolerance	4.21	0.74	Very High
Emotional release	4.18	0.79	High
Overactivity	4.27	0.58	Very High
Relaxation/recreation	4.31	0.66	Very High
Substance use	3.83	0.85	High
<b>Overall</b>	<b>4.22</b>	<b>0.71</b>	<b>Very High</b>

The findings of this research supported earlier studies emphasizing the importance of a supportive classroom environment, appreciation for diversity, and their impact on student persistence. According to Dumagyo and Ponsades (2024), in technical livelihood education, academic resilience among students was significantly boosted by supportive learning environments and assertive classroom management strategies. The same was concluded by Mindo and Paglinawan (2025), as they established that there was a positive correlation between students' motivation in science classes and the classroom environment. It indicated that a stimulating and motivating classroom enhances student engagement. Based on Thompson (2024), developing an inclusive learning environment focused on fairness, diversity, and inclusion also prepares students to achieve in their chosen careers. Collectively, these studies highlighted how important a supportive and welcoming classroom environment was for encouraging students' perseverance and achievement.

### Significance on the Relationship Between Teaching Strategies and Student Engagement

Displayed in Table 5.1 was the relationship between the independent variable (teaching strategies) and the dependent variable (student engagement). The overall coefficient of correlation is 0.818, with a p-value of 0.001, which was lower than the 0.05 level of significance. This means a significant relationship existed between teaching strategies and student engagement, as the probability value is  $p < 0.001$ . Thus, the null hypothesis of no significant relationship was therefore rejected. The overall correlation coefficient of 0.818 indicated a positive very strong correlation between the two variables.

**Table 5.1**

*Significance on the Relationship between teaching strategies and student engagement*

Variables Correlated	R	p-value	Decision on H <sub>0</sub>	Decision on Relationship
teaching strategies and student engagement	0.818**	<0.001	Rejected	Significant

The findings align with Heilporn et al. (2022), who emphasized that trust, relevant activities, and consistent pacing boost engagement in blended learning. Similarly, Zhang et al. (2024) found that teaching methods significantly impact student engagement, mediated by students' perceptions of teachers' emotional involvement. Han (2021) also noted that teachers with a strong self-concept tend to use more engaging methods, enhancing student participation.

### Significance on the Relationship Between Teaching Strategies and Classroom Learning Engagement

Displayed in Table 5.2 was the relationship between the independent variable (teaching strategies) and the mediating variable (classroom learning environment). The overall coefficient of correlation was 0.786, with a p-value of 0.001, which is lower than the 0.05 level of significance. This means a significant relationship existed between teaching strategies and classroom learning environment since the probability value was  $p < 0.001$ . Thus, the null hypothesis of no significant relationship was therefore rejected. The overall correlation coefficient of 0.786 also showed a positive strong correlation between the two variables.

**Table 5.2**

*Significance on the Relationship between teaching strategies and classroom learning environment*

<b>Variables Correlated</b>	<b>r</b>	<b>p-value</b>	<b>Decision on H<sub>0</sub></b>	<b>Decision on Relationship</b>
<i>teaching strategies and classroom learning environment</i>	0.786**	<0.001	Rejected	Significant

The findings aligned with recent studies highlighting the significant relationship between teaching strategies and the classroom learning environment. For instance, Almonia and Oliva (2023) discovered that the classroom climate moderates the association between teacher creativity and academic resilience among students, stressing the impact of teaching approaches on the learning environment. Likewise, Arifin et al. (2024) proved that teacher professional development and classroom environment both have a major influence on students' academic performance, emphasizing the importance of effective teaching strategies in creating a learning-friendly environment. Additionally, a study by Oracion et al. (2024) found that student engagement was moderately correlated with teaching strategies, emphasizing the significance of instructional methods in improving the classroom environment.

### **Significance on the Relationship between Classroom Learning Environment and Student Engagement**

Displayed in Table 5.3 was the relationship between the mediating variable (classroom learning environment) and the dependent variable (student engagement). The overall coefficient of correlation is 0.825, with a p-value of 0.001, which was lower than the 0.05 level of significance. This means a significant relationship existed between classroom learning environment and student engagement since the probability value was  $p < 0.001$ . Thus, the null hypothesis of no significant relationship was therefore rejected. The overall correlation coefficient of 0.825 also showed a positive very strong correlation between the two variables.

**Table 5.3**

*Significance on the Relationship between classroom learning environment and student engagement*

<b>Variables Correlated</b>	<b>r</b>	<b>p-value</b>	<b>Decision on H<sub>0</sub></b>	<b>Decision on Relationship</b>
<i>classroom learning environment and student engagement</i>	0.825**	<0.001	Rejected	Significant

The findings aligned with recent studies emphasizing the significant relationship between classroom learning environment and student engagement. Bernal and Palma (2025) proved that the learning environment in the classroom has a significant influence on student engagement in learning the Filipino language. Likewise, Duterte (2024) discovered that technology-based learning environments enhanced student engagement and learning outcomes in higher education. Also, Lagrimas and Buenaventura (2022) pointed out that a constructivist learning environment partially mediates the relationship between school culture and student engagement in Technology and Livelihood Education.

### **Mediation Analysis of Teaching Strategies, Classroom Learning Environment, and Student Engagement using Path Analysis**

Displayed in the "Regression Weights: (Group number 1 - Default model)" section were the results of the path analysis, which illustrate the relationships between the independent variable (IV) — Teaching Strategies, the

dependent variable (DV) — Student Engagement, and the mediating variable (MV) — Classroom Learning Environment. Additionally, the result of the path analysis was visually represented in the "Path Diagram for the Regression Model" figure 2.

In Step 1, path C (IV and DV), it was revealed in the regression analysis between teaching strategies and student engagement that there was a significant influence. The result yielded an estimate of .935, with a standard error (SE) of .037 and a p-value of 0.000, which was lower than the 0.05 level of significance. This means that teaching strategies have a significant influence on student engagement since the probability value was  $p < 0.000$ . Therefore, the null hypothesis of no significant relationship is rejected.

Step 2, path A (IV and MV), with the presence of the mediating variable, revealed in the regression analysis between teaching strategies and classroom learning environment that there is a significant influence. The result yielded an estimate of .863, with a standard error (SE) of .039 and a p-value of 0.000, which is lower than the 0.05 level of significance. This indicates that teaching strategies significantly affect the classroom learning environment.

In Step 3, which was path B (MV and DV), with the presence of the mediating variable, it was revealed in the regression analysis between classroom learning environment and student engagement that there was a significant influence. The result yielded an estimate of .494, with a standard error (SE) of .047 and a p-value of 0.000, which is lower than the 0.05 level of significance. This means a significant influence existed between classroom learning environment and student engagement since the probability value is  $p < 0.000$ . Therefore, the null hypothesis of no significant relationship was rejected.

Moreover, step 4, path C', the combined influence of IV and MV on DV was examined. It was revealed that student engagement (DV) regresses on classroom learning environment (MV) and teaching strategies (IV). The result yielded an estimate of .508, with a standard error (SE) of .052 and a p-value of 0.000, which was lower than the 0.05 level of significance. This means a significant influence existed between the three variables, indicating that both teaching strategies and classroom learning environment significantly contribute to student engagement. Therefore, the null hypothesis of no significant relationship is rejected.

**Mediation Analysis of the Three Variables using Path Analysis**



**Regression Weights: (Group number 1 - Default model)**

		Estimate	S.E.	C.R.	P
Student Engagement	<--- Teaching Strategies	.935	.037	24.977	***

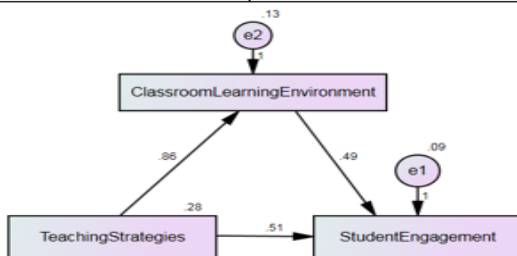


Figure 2. Path Diagram for the Regression Mode

**Regression Weights: (Group number 1 - Default model)**

		Estimate	S.E.	C.R.	P
Classroom Learning Environment	<--- Teaching Strategies	.863	.039	22.315	***
Student Engagement	<--- Teaching Strategies	.508	.052	9.768	***
Student Engagement	<--- Classroom Learning Environment	.494	.047	10.416	***

**Partial Mediation.**

Since all three paths (A, B, and C) are significant, mediation analysis through path analysis was warranted to assess the significance of the mediation effect. The findings of the mediation analysis showed that the effect of teaching strategies on student engagement is partially mediated by the classroom learning environment. This is evident in the regression coefficient, which was substantially reduced after being mediated by the classroom learning environment but remains significant, with a p-value of 0.000. This suggested partial mediation, as the effect of teaching strategies on student engagement continues to be significant even after accounting for classroom learning environments.

The findings of the effect size computation in the mediation test between the three variables were shown in the figure 2, regression weights. The effect size indicated how much of the indirect path's effect on student engagement can be attributed to teaching strategies through the classroom learning environment. The beta value of teaching strategies towards student engagement is 0.935, representing the total effect value. The beta value of teaching strategies towards student engagement with classroom learning environment included in the regression has a direct effect value of 0.508. The indirect effect value of 0.426 is the multiplied portion of the original correlation between teaching strategies to classroom learning environment, which is 0.863, and classroom learning environment to student engagement, which is 0.494.

The ratio index was computed by dividing the indirect effect by the total effect. In this case, 0.426 was divided by 0.935 equals 0.456. This indicates that approximately 45.6% of the total effect of teaching strategies on student engagement was mediated by classroom learning environment, while the remaining 54.4% is either direct or mediated by other factors not included in the model.

The results on the mediation analysis conformed to Piaget's (1977) and Vygotsky's (1978) constructivist theory, learning occurs most effectively when pupils actively create their own knowledge in a dynamic, interactive setting. Constructivist teaching methods emphasized inquiry-based learning, student-centered learning, and the incorporation of concepts like teamwork. In this regard, the classroom setting stimulates and fosters involvement by providing social and cognitive resources that enable students to actively participate in the educational process. According to Tam (2000), "Constructivism Learning Theory: A Paradigm for Teaching and Learning" emphasized the value of social, collaborative, and active learning as well as the part teachers play in helping students find and, through interactive means, create an environment that gives them the ability to take charge of their own education. It connects these elements to greater engagement, especially through reflective practices and authentic work (Tam, 2000). Constructivism holds that students actively generate knowledge via their experiences, hence it is essential to promote inquiry, debate, and problem-solving in the classroom (PMC, 2021; Georgia Tech, 2023). This perspective emphasized how instructional strategies and learning environments significantly impact students' engagement by providing opportunities for collaborative inquiry, critical thinking, and idea formation in social contexts (Anderson et al., 2020; Johnson, 2022).

The ecological systems theory of Bronfenbrenner (1979) placed a strong emphasis on how the environment affects human development. Micro-level interactions between students and their physical and psychological surroundings are very important in a classroom setting. It is possible to view the classroom as a component of the student's microsystem, which has a direct impact on their emotional, behavioral, and cognitive learning engagement. The idea is used in the paper "Exploring Learning Environment through Bronfenbrenner's Ecological Systems Theory" by Rahmat (2023), which explores how the many ecological systems, microsystem, mesosystem, exosystem, and macrosystem, interact and impact the learning environment.

The study focused on how exterior social structures (exosystem), teacher involvement (microsystem), and community-based learning (mesosystem) sustain a supportive, well-balanced classroom atmosphere that increases student engagement. According to Rahmat (2023), the assisted learning environment fosters academic performance and internal motivation by means of the interplay of such systems. This study was positioned within the theoretical framework of Bronfenbrenner's (1995) theory of human development, which emphasized the significance of different ecological levels in the educational process.

According to a number of research, including Kearsley & Shneiderman (1998) engagement theory, learning might be more effective when students' participation was maximized through meaningful and cooperative tasks. Engagement is influenced by both instructional techniques and the standard of the classroom setting. Yilmaz

(2021)'s paper "Innovating the Communication Pedagogy: An Application of Flipped Classroom Technique in Communication Education" makes use of Kearsley and Shneiderman's (1998) Engagement Theory, which highlights how engagement enhances the learning process for students. The study's use of the flipped classroom approach promotes active learning, which is consistent with the theory's central premise of active participation. This approach promoted deeper participation through interactive activities and group projects, which is crucial for establishing a fruitful learning environment.

## SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

### Summary of Findings

The key outcomes of the study were the following:

1. The level of teaching strategies had an overall descriptive equivalent of High. Additionally, teaching strategies obtained an overall mean of 4.10, indicating that it was oftentimes evident. Among the five dimensions, effective strategies had the highest mean of 4.17, while behavioral strategies had the lowest mean of 4.05.
2. The level of student engagement had an overall descriptive equivalent of High. Furthermore, student engagement obtained an overall mean of 4.07, signifying that engagement among students was oftentimes evident. Emotional engagement had the highest mean of 4.15, while agentic engagement had the lowest mean of 3.89.
3. The level of classroom learning environment had an overall descriptive equivalent of High. In addition, the classroom learning environment obtained an overall mean of 4.08, demonstrating that positive classroom learning environments were oftentimes manifested. Classroom positive received the highest mean of 4.10, persistence in major had the lowest mean of 4.06.
4. The relationship between teaching strategies and student engagement proved to have a positive, very strong correlation, with an  $r$ -value of 0.818 and a  $p$ -value of  $<0.001$ , which was lower than the significance level of 0.05. This result indicated that the null hypothesis was rejected, confirming a significant relationship between teaching strategies and student engagement. Among effective strategies, emotional engagement had the highest correlation with student engagement.
5. The relationship between teaching strategies and classroom learning environment showed a positive strong correlation, with an  $r$ -value of 0.786 and a  $p$ -value of  $<0.001$ , which was lower than the significance level of 0.05. This result led to the rejection of the null hypothesis, confirming a significant relationship between teaching strategies and classroom learning environment. Effective strategies and positive classrooms had the highest correlation.
6. The relationship between classroom learning environment and student engagement exhibited a positive, very strong correlation, with an  $r$ -value of 0.825 and a  $p$ -value of  $<0.001$ , which was lower than the significance level of 0.05. This result indicated that the null hypothesis was rejected, confirming a significant relationship between classroom learning environment and student engagement.
7. The mediation analysis confirmed that the classroom learning environment partially mediated the relationship between teaching strategies and student engagement. Path analysis revealed that 45.6% of the effect of teaching strategies on student engagement was mediated by classroom learning environment, while the remaining 54.4% was either direct or influenced by other factors not included in the study.

### Conclusions

In light of this study's findings, the following statements were constructed:

1. The data showed a high level of teaching strategies, which means oftentimes evident. The study's results indicated that effective teaching methods contribute to a supportive learning environment, with student involvement and instructional approaches being key factors. The findings highlighted that well-designed

teaching strategies are essential for boosting student engagement, enhancing understanding, and promoting academic achievement.

2. The level of student engagement was high, which means oftentimes evident. The findings showed that students often join discussions and activities, with participation being the most common. They interact with lessons, share feedback, and work together, showing the value of interactive teaching. However, fewer students take the initiative to study and learn on their own.

3. The classroom learning environment was rated high, which means oftentimes manifested. The findings showed that students enjoy a supportive and interactive classroom, especially clear lessons and engaging activities. While a positive atmosphere is important, students are more influenced by how lessons are taught and the materials used rather than classroom rules and teacher support.

4. There was a positive, very strong correlation between teaching strategies and student engagement. The findings indicated that using interactive and effective teaching methods increases student participation. This suggested that educators should incorporate engaging activities and interactive lessons to enhance student involvement and learning outcomes.

5. There was a positive strong correlation between teaching strategies and the classroom learning environment. The findings showed that effective teaching methods create a supportive and engaging space for students. Interactive activities and clear instruction helped improve the learning atmosphere, emphasizing the role of good teaching in enhancing student experiences.

6. There was a positive, very strong correlation between the classroom environment and student engagement. The findings suggested that while a positive classroom setting encourages participation, other factors like teaching methods, available resources, and peer support also influence engagement. This emphasized the importance of creating an inclusive and well-organized learning space to keep students actively involved.

7. The mediation analysis confirmed that the classroom learning environment partially mediates the relationship between teaching methods and student engagement. The findings suggested that while teaching directly influences engagement, a positive classroom setting makes this effect stronger. This highlighted the importance of creating a supportive space to keep students involved in learning. Path analysis showed that 45.6% of the impact of teaching strategies on student engagement was influenced by the classroom learning environment, while the remaining 54.4% was affected by other factors not covered in the study. The findings suggested that while a supportive classroom enhances engagement, other aspects like motivation, peer support, and learning materials may also contribute to student involvement.

## Recommendations

The following recommendations were derived from the study's findings and conclusions.

1. The Commission on Higher Education (CHED) may incorporate results from this study into policy suggestions and curriculum standards for higher education institutions. This can be in the form of advancing classroom environment standards to promote student engagement, faculty development programs that enhance effective teaching methods, and research on innovative learning environments. Moreover, CHED can encourage colleges and universities to implement evidence-based interventions to improve students' motivation and persistence in their fields of study.

2. School administrators were encouraged to prioritize resolving the lowest-ranked indicator, "Persistence in Major," by creating programs that assist students in maintaining their interest in the field of study they have chosen. This could include career advising programs, mentorship opportunities, and academic support that assist students in overcoming obstacles. Also, ongoing evaluation of students' academic motivation and offering interventions as necessary can improve retention and long-term achievement.

3. Teachers may prioritize working on the lowest-rated indicator, "Behavioral Strategies," through implementing more formal classroom routines and encouraging positive behavior through active learning methods. This may include gamified learning activities, collaborative assignments, and instruction differentiated to meet multiple learning styles. Giving timely feedback and creating a welcoming climate in which students can share their ideas safely can also lead to greater levels of engagement.
4. Students were encouraged to become more engaged in their own learning. Students can do this through establishing individualized learning goals, engaging actively in class discussion, and employing multiple academic tools to achieve a higher level of comprehension. Seeking teacher mentorship, working in groups, and welcoming opportunities for independent learning also can help students become more engaged and successful academically.
5. Parents may contribute to engagement by establishing a supportive home environment that complements school efforts. Active communication with instructors, utilization of a growth mindset, and involvement in the child's learning process can enhance motivation and engagement among students. Parents can be involved in workshops that emphasize successful strategies for facilitating student learning at home by schools.
6. Future researchers may build on this research by investigating other variables affecting student engagement, including intrinsic motivation, peer interaction, and instructional technology. Longitudinal studies tracking changes in engagement over time might have a more profound understanding of the effectiveness of differing teaching approaches. Further, the incorporation of qualitative research methods, such as focus group discussions or in-depth interviews, might provide a better understanding of the learning experiences of students.

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