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Learning Environment and Teacher Communication Behavior as Determinants of Student Engagement

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ABSTRACT

This study aimed to determine which domains of learning environment and teacher communication behavior as determinants of student engagement. The study involved a total of 300 junior high school students particularly those in Grade 9, from one of the public schools in Davao del Sur division were included in the study using a universal sampling technique. The data gathered were analyzed using descriptive-correlational techniques. The results revealed that there was a high relationship between cognitive engagement and community of peers, high cognitive engagement, and faculty relationships, high cognitive engagement and academic climate, high cognitive engagement and meaningful engagement, high cognitive engagement and mentoring, high cognitive engagement and non-verbal support, high cognitive engagement and understanding and friendly, and high cognizant engaging and encouraging and praise. According to the results, academic climate significantly best influenced student engagement and this domain also of learning environments that significantly best affected the students. The relationships between learning environment, teacher communication behavior, and student engagement were all statistically significant, with moderate to strong positive correlations. The following recommendations were laid down: the teachers are encouraged to play and active role in the students' engagement to create activities that encourage meaningful engagement, they can be exposed to training about properly preparing classroom to steer engagement in students, and teachers and schools to provide opportunities for students to take part in improving school needs by respectfully suggesting what needs do they see that can help the institution become a place where they can feel at ease while learning.

INTRODUCTION

Student engagement is a crucial element in encouraging successful learning and academic achievement. Nevertheless, there has been an increase in worries regarding the decreasing levels of student engagement in educational environments in recent years (Fredricks *et al.*, 2019). Insufficient student engagement not only impacts students' learning experience but also has lasting effects on their educational achievements and future success (Quines & Relacion, 2022). Hence, it is imperative for educators and researchers to grasp the elements that affect student engagement. Its common occurrence continually poses challenges among teachers which resulted to a declined student performance. These students who are disengaged might also be identified as those who do not do their homework, are involved in disruptive activities or display negative attitudes to teachers and other students.

The engagement of students forms the fundamental basis for effective learning experiences, encompassing cognitive, behavioral, and emotional dimensions (Bond *et al.*, 2022; Fredricks *et al.*, 2019; Li & Xue, 2023). Extensive research underscores the significance of student engagement, not only as a predictor of academic achievement but also as a catalyst for fostering critical thinking skills, motivation, and positive attitudes towards learning (Cooper, 2020; Reeve, 2019). As education advances, there is an increasing recognition and understanding among educators and policymakers regarding the factors that contribute to or hinder student participation, making it an imperative area of focus.

Meanwhile, the physical and social context of learning, commonly called the learning environment, plays a key role in influencing student participation (Chapman, 2019; Halverson & Graham, 2019; Skinner & Belmont, 1993). This includes elements such as classroom design, resources, and overall atmosphere, which have a major impact on the quality of students' interaction with educational content. Understanding how these environmental factors contribute to engagement or delay is essential for teachers who want their students to be able to take the best of learning experiences.

Earlier research has examined how both the learning environment and teacher communication behaviors influence student engagement. Despite that, there is a gap in our understanding how these two factors work together to impact student engagement. Many studies have focused on either the classroom environment or teacher communication behavior, neglecting to consider the synergized effect of both (Reeve, 2019). Thus, leaves us with a little understanding of how the learning environment and teacher communication interplay to promote student engagement.

In essence, the complex relationship between the learning

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environment and teacher communication behavior is the key to unlocking students' unparalleled engagement. This study is aimed at providing valuable insights into the ongoing discussion on educational practices and policies and promoting students' participation and enrichment of learning experiences.

This study aims to determine which domains of learning environment and teacher communication behavior as determinant of student engagement. Specifically, it sought to find the answers of the following objectives:

First, to describe the level of the learning environment in various aspects, including the community of peers, teacher and student relationships, academic climate, meaningful engagement, mentoring, inclusion and safety, and physical space. Second, to describe the level of teacher communication behavior, including aspects such as challenging students, providing encouragement and praise, offering non-verbal support, being understanding and friendly, and exercising control. Third, to describe the level of student engagement in terms of affective engagement, behavioral engagement, and cognitive engagement. Fourth, to determine the significant relationship between the learning environment and student engagement, as well as between teacher communication behavior and student engagement. Lastly, to identify which domains of the learning environment and teacher communication behavior have the most significant impact on student engagement.

The following null hypotheses were treated at 0.05 level of significance. There is no significant relationship between learning environment and student engagement and teacher communication behavior and student engagement. There is no domain of learning environment and teacher communication behavior best influences student engagement

LITERATURE REVIEW

Provided in this section are the discussions on the principles, concepts, ideas and viewpoints from various authors. The first variable of this study is learning environment which is taken from the study of Rusticus *et al.* (2022); Shochet *et al.* (2013) which has the following indicators: community of peers, faculty relationships, academic climate, meaningful engagement, inclusion and safety, and physical space.

According to Florescu (2020), learning environments play an important role in supporting and improving learning outcomes. It provides students with opportunities to participate in meaningful activities, collaborate with peers, receive feedback and access relevant learning resources. Through the design of a conducive learning environment, educators can create stimulating and engaging experiences that promote active learning, critical thinking and problem-solving skills.

Scholars such as Tinto (2022) and Havik and Westergard (2020) emphasize that a positive peer community enhances student retention and involvement, necessitating intervention like group activities and peer support programs. Additionally, meaningful teacher-student relations contribute to student engagement, with teacher involvement, approachability, mentorship, and positive feedback positively influencing learning outcomes (Smith & Tinto, 2022).

The educational environment's impact on student engagement extends to prevailing attitudes, expectations, and support within academic institutions (Halverson & Graham, 2019). Positive school climates, as highlighted by Lee *et al.*'s 2019 study, foster student motivation and achievement through clear academic expectations, challenging objectives, and recognition of accomplishments. Meaningful engagement, as advocated by Rui Li (2023) involves active, reflective, and purposeful interaction with course content. Creating a safe and inclusive environment, recognizing diversity and ensuring equal opportunities, is essential for student well-being and active participation (Zepke, 2021; Osher *et al.*, 2019).

Communication behaviors of teachers have a substantial impact on the learning environment and student engagement in various dimensions, including affective, behavioral, and cognitive aspects. Educators must be aware of the importance of providing challenging instruction, encouragement, praise, non-verbal support, understanding, friendliness, and maintaining a balance of control to enhance student learning experiences. Setting high expectations, presenting complex material, and encouraging critical thinking skills are essential components of challenging communication, as supported by studies emphasizing the positive relationship between challenging teaching practices and student achievement (Quines & Relacion, 2022; Krahe *et al.*, 2021).

Encouragement and praise significantly influence student motivation and self-esteem, according to research underscoring the importance of positive reinforcement in shaping student behavior and attitudes toward learning (Bukit *et al.*, 2023). Positive feedback and recognition of students' efforts contribute to increased affective and behavioral engagement, while non-verbal communication like gestures, body language, and facial expressions play a crucial role in conveying support and creating a positive classroom climate (Brobo, 2022; Qobilovna, 2023). Maintaining understanding, friendliness, and a balanced approach to control contribute to fostering positive teacher-student relationships and creating a supportive learning environment that promotes student engagement and a sense of belonging (Xie & Derakhshan, 2021; Deci & Ryan, 2008).

In educational research, student engagement is a crucial element encompassing emotions, actions, and thoughts, playing a significant role in understanding student involvement in the learning process. Affective engagement focuses on the emotional commitment of students towards their learning experiences, reflecting eagerness, curiosity, and positive emotional behavior. It is closely related to motivation and a sense of belonging within the learning community (Fredricks *et al.*, 2019). Engagement is the emotional involvement and passion

that characterizes the motivation and desire to participate and accomplish learning activities, according to Skinner and Belmont (1993).

Behavioral engagement, as discussed by Chapman (2019), refers to the observable actions and participation levels of students in class, including completing assignments and exhibiting on-task behavior. Teacher-student relationships and effective classroom management are highlighted by Engels *et al.* (2021) as influential factors in behavioral engagement. In terms of cognitive engagement, Fredricks *et al.* (2019) define it as the use of higher-order thinking skills and active problem-solving. Instructional strategies like inquiry-based learning and metacognitive reflection challenge students to think critically and apply their knowledge, ultimately enhancing cognitive engagement (Bukit *et al.*, 2023; Trowler *et al.*, 2022).

The literature cited above have some common elements which are related to the present study. It gave the researcher the idea and confidence that the study being undertaken has an anchor on accepted and proven principles drawn from research. Further, the literatures cited in this study helped the researcher in the contextualization of the questionnaires.

This study is anchored on Self Determination Theory (SDT) which posits that students are more likely to engage in their learning when they have a sense of autonomy, competence, and relatedness (Deci & Ryan, 2008). Autonomy refers to the students' need for control and choice in their learning processes, allowing them to pursue topics and methods that align with their interests and goals. Competence entails providing students with challenging yet attainable tasks that foster a sense of mastery and growth. Relatedness involves creating a supportive and inclusive learning environment where students feel connected to their peers and teachers, fostering a sense of belonging and social interaction. SDT suggests that when these three psychological needs are met, students are more motivated, engaged, and successful in their academic pursuits.

This study is also anchored on The Social Cognitive Theory (SCT) which emphasizes the role of observational learning and social interaction in student engagement. According to SCT, students learn by observing and imitating others, particularly role models such as teachers and peers. Additionally, SCT highlights the importance of social interaction and collaborative learning, as it provides opportunities for students to engage in discussions, exchange ideas, and receive feedback, which enhances their motivation and engagement (Bandura, 2008).

Another theory on which this study is anchored is The Flow Theory, proposed by Mihaly Csikszentmihalyi, suggests that optimal student engagement occurs when the level of challenge in a task aligns with the student's skill level. When the challenge is too low, students may become bored and disengaged. Conversely, if the challenge is too high, students may feel overwhelmed and anxious. Flow theory posits that when students are immersed in a state of flow, characterized by a balance between their skills and the task's difficulty, they experience a deep sense of concentration, enjoyment, and intrinsic motivation (Csikszentmihalyi *et al.*, 2018).

Meanwhile, Li and Xue (2023), Jones and Jones (2019) stated that learning environment is indispensable in student engagement. The learning environment plays a role in establishing a culture of student engagement. More so, learning environment shapes how students become engaged in the classrooms where they become active in making their learning.

In addition, the pronouncement of Mitchell *et al.* (2019); Xie and Derakhshan (2021) who pointed out that teacher communication behavior is essential in the foundation of developing a sense of student engagement. Hence, teachers are always encouraged to consistently practice desirable communication behavior to increase academic engagement of the students.

The study focuses on two independent variables: learning environment and teacher communication behavior. The learning environment includes indicators such as community of peers, teacher and student relationships, academic climate, meaningful engagement, inclusion and safety, and physical space. Community of Peers emphasizes students' connection and sense of belonging, while Teacher and Student Relationship highlights the positive link between students and teachers. Academic Climate refers to students' ease in meeting academic requirements, and meaningful engagement involves students in decision-making. Inclusion and safety create a safe space for students to express themselves, and Physical Space contributes to a conducive learning environment. On the other hand, teacher communication behavior includes indicators like challenging activities, encouragement, non-verbal support, understanding, and controlling behaviors.

The dependent variable of the study is student engagement, encompassing affective, behavioral, and cognitive engagement. Affective engagement reflects students' emotional attachment and fondness for learning at school, while behavioral engagement shows their interest in excelling academically. Cognitive engagement involves students relating their school learnings to real-life experiences and analyzing the connections. The study draws from various sources like Rusticus, Pashootan and Mah (2022) for the learning environment variable, Fauziah and Irmayanti (2023) for teacher communication behavior, and Johnson *et al.* (2022) for student engagement indicators. By examining these variables, the study aims to understand the factors influencing student engagement in the educational setting.

MATERIALS AND METHODS

Research Respondent

The study involved Grade 9 students from the Division of Davao del Sur, with a total of 300 out of 330 enrolled students participating as respondents. Grade 9 students were chosen due their significant role in the educational transition from middle school to high school, which

involves notable changes in academic standards, social interactions, and individual growth. The study aimed to gather important information about the unique experiences, obstacles, and perspectives of Grade 9 students during this transitional period. This school was selected as the research site due to its diverse student body and high educational standards, allowing for a comprehensive understanding of the school environment. The study utilized universal sampling, also known as census sampling, where all Grade 9 students from this school were given the opportunity to participate, ensuring equal representation and minimizing potential biases in the findings (Cheng *et al.*, 2022).

These junior high school students are formally enrolled in the academic year 2022–2023. If respondents are under the age of minors or below 18 years old, the researcher would fully explain the scope of the study and obtain their consent prior to administering the survey questionnaire, its implications, and risk. The research also obtained a consent from both the respondents' parents and the respondents themselves. The respondents were informed that they could withdraw from participating anytime in the research process. In participating in the study, they were given the free will and was informed that the study is not compulsory for them to get involved. They will be assured that no threats, intimidation, force, or duress will be manifested against them and that their responses will be treated with full secrecy and should not be revealed or disclosed to anyone. Teachers, principal, and office staff in the above chosen secondary school in Davao del Sur were excluded in the study. Senior high school as well as Grade 7, 8, and 10 students were excluded to participate in the study.

Materials and Instrument

The research instrument used by the researcher in gathering data has three parts. The questionnaire dealt with the learning environment, this is an adopted questionnaire developed by Shochet, Colbert-Getz and Wright (2013); Rusticus, Pashootan and Mah (2022) for teacher communication behavior is taken from Matos, Leite, Brown and Cirino (2014); Fauziah and Irmayanti (2023) and for student engagement which is taken from Hart, Stewart and Jimerson (2011); Johnson *et al.* (2022). The questionnaire has undergone pilot testing in one of the schools in Davao del Sur to establish reliability and validity. Each variable questionnaire has 2-5 questions for each domain. The validator's mean rating of survey questionnaire was 4.34 signifying strong validation. Based on the result of data during pilot testing the result was acceptable. For each item, the research participant will choose among 5-point agreeableness scaling: 5 for always, 4 for often, 3 for sometimes, 2 for seldom and 1 for never. In evaluating the learning environment, teacher communication behavior and student engagement the following five ranges of means and descriptions were used. The first range, from 4.20 to 5.00, represents a very high level. This means that the provision related to the learning environment, teacher communication behavior and student engagement as described in the item, is consistently observed. The second range, from 3.40 to 4.19, indicates a high level. In this case, the provision is often observed in the learning environment, teacher communication behavior and student engagement. Moving on to the third range, from 2.40 to 3.39, we have a moderate level.

This suggests that the provision related to the learning environment, teacher communication behavior and student engagement is sometimes observed. The fourth range, from 1.80 to 2.39, represents a low level. Here, the provision is rarely observed in the learning environment, teacher communication behavior and student engagement. Finally, the fifth range, from 1.00 to 1.79, signifies a very low level. In this case, the provision related to the learning environment, teacher communication behavior and student behavior is never observed in the item.

Design and Procedure

The research design employed in this study is a non-experimental quantitative approach utilizing descriptive-correlational techniques. This methodological choice was made because the independent variable under investigation was not manipulated, and there was no random assignment to groups. As highlighted in Bloomfield and Fisher's study (2019), descriptive research design entails the comprehensive description of existing conditions variables, facilitating a thorough elucidation of the situation. Descriptive research serves to illuminate prevailing issues or concerns, evaluating the nature and extent of association between the learning environment and student engagement, as well as teacher communication behavior and student engagement. Moreover, the correlational aspect of the design allows for the determination of significant relationships between the variables, identifying patterns of association between them. This approach is solely focused on describing current conditions without the interference of the researcher (Quantitative Descriptive & Correlational Research, 2023).

In terms of procedure, the researcher adhered to specific protocols for data collection, beginning with obtaining permission from the Schools Division Superintendent to conduct research in one of the national high schools. Following approval, a letter of endorsement was provided to the District Supervisor and to school principal involved to facilitate data collection. The research instrument was personally distributed and explained to participants before they completed the questionnaire. To ensure data accuracy, a Certificate of Appearance was obtained from the School Head to validate the integrity of data collection. Statistical analyses were employed to interpret the data, organized based on evaluation indicators. Cronbach's Alpha values for Learning Environment, Teacher Communication Behavior, and Student Engagement exceeded .7, indicating high consistency.

Pearson's Correlation Coefficient was utilized to analyze

the relationship between learning environment, teacher communication behavior, and student engagement. Additionally, regression analysis was employed to ascertain which aspects of the learning environment and teacher communication behavior influenced student engagement. It's important to note that data collection commenced upon obtaining UMERC Certificate, ensuring adherence to ethical protocols. Privacy and confidentiality were rigorously maintained, and participants were fully informed about the study through the informed consent process. Recruitment of junior high school students employed a universal approach, free from physical harm or risks. Measures were implemented to prevent plagiarism, fabrication, or falsification of data, promoting accuracy and honesty. Conflict of interest was managed through collaboration and respect for participants' autonomy. Face-to-face interviews were conducted with relevant authorities' permission, and revisions were made based on advisor recommendations to uphold professionalism and integrity.

RESULTS AND DISCUSSION

Learning Environment

Shown in Table 1 is the level of learning environment scale in terms of community of peers, teacher and student relationships, academic climate, meaningful engagement, mentoring, inclusion and safety, and physical space. The overall mean score of the level of learning environment was 4.16 and standard deviation 0.43, which was described as High. The indicator with the highest mean was mentoring 4.49 and SD 0.66, with a descriptive level of Very High. It is then followed by inclusion and safety 4.37 and SD 0.56, which was also described as Very High. Then physical space has a mean of 4.24 and SD 0.75 described as Very High followed by academic climate that has a mean of 4.23 and SD 0.55, described as Very High. Next was teacher and student relationships have a mean of 4.05 and SD 0.67, with a descriptive level of High, followed by community of peers has a mean of 3.96 and SD 0.63, described as High. Meaningful Engagement has the lowest mean of 3.80 and SD 0.70 or described as High. This result means that the respondents' level of learning environment in terms of mentoring, inclusion and safety, physical space, and academic climate is Very High while faculty relationships, community of peers, and meaningful engagement were High.

Table 1: Level of Learning Environment

Indicators	Mean	SD	Descriptive Level
Mentoring	4.49	0.66	Very High
Inclusion and Safety	4.37	0.56	Very High
Physical Space	4.24	0.75	Very High
Academic Climate	4.23	0.55	Very High
Teacher and Student Relationships	4.05	0.67	High
Community of Peers	3.96	0.63	High
Meaningful Engagement	3.80	0.70	High
Overall	**4.16**	**0.43**	**High**

The results imply that the learning environment is generally well balanced, with high scores across multiple dimensions, including mentoring, inclusion and safety, physical space, and academic climate. This indicates that the institution or program has effectively addressed various aspects of the learning environment. While the overall learning environment is perceived as high, there may be opportunities to further enhance the areas with relatively lower means, such as meaningful engagement, community of peers, and teacher-student relationships.

The study reveals that high levels of mentoring, inclusion and safety, physical space, academic climate, teacher-student relationships, peer community, and engagement within learning environments significantly impact academic success and motivation, particularly for marginalized student groups facing additional obstacles. Effective mentorship plays a pivotal role in enhancing academic performance and motivation, especially for marginalized students, aligning with previous research findings of Jones and Jones (2019); Cayubit and Francis (2021). Elevated levels of inclusivity and safety foster motivation and participation, which is crucial for marginalized students experiencing discrimination and bullying affirms with the research of Florescu (2020) and Nuan et al (2021). Additionally, ample physical space availability correlates with enhanced access to resources, supporting student learning, particularly for those lacking such resources outside of school is confirmed with the research of Jalal et al (2023) and Trowler et al (2022). A conducive academic climate, meaningful teacher-student relationships, supportive peer communities, and significant engagement further contribute to academic success and motivation, echoing existing literature of Li and Xue (2023); Quines and Relacion (2022); and Froment and de-Besa (2022).

Teacher Communication Behavior

Shown in Table 2, the level of teacher communication behavior, obtain an overall mean score of 4.02 and standard deviation 0.51, which was described as High. This signifies that the respondents' engagement was observed. Also shown in the table, the indicator which have the highest mean score was understanding and friendly 4.18 and

SD 0.70 with a descriptive value of High. It was followed by controlling with a mean of 4.11 and SD 0.60, which was described as High. Further followed by indicators challenging with a mean of 4.06 and SD 0.58 which was described as High, non-verbal support with a mean of 3.96 and SD 0.74, which was is described as High. The indicator with the lowest mean score is encouragement and praise 3.81 and SD 0.74 and is interpreted again as High. The results exposed that the dimension of teacher communication behavior in terms understanding and friendly, controlling, challenging, non-verbal support, and encouragement and praise was notably High.

Table 2: Level of Teacher Communication Behavior

Indicators	Mean	SD	Descriptive Level
Understanding and Friendly	4.18	0.70	High
Controlling	4.11	0.60	High
Challenging	4.06	0.58	High
Non-verbal Support	3.96	0.74	High
Encouragement and Praise	3.81	0.74	High
Overall	**4.02**	**0.51**	**High**

The results imply that teacher communication is equally balanced, with high scores in all domains. This indicates that while teachers exhibit competency in various communication aspects, addressing areas like encouragement and praise can further enhance their communication behavior, thereby better supporting students' learning endeavors. This emphasized the significance of teacher-student communication that is supportive in nature.

The research findings underscore the commendable proficiency demonstrated by teachers in various aspects of communication, significantly contributing to the establishment of a positive learning environment. The high mean score for understanding and friendly communication highlights teachers' adeptness in comprehending students' needs and maintaining a friendly demeanor affirms with previous scholarly investigations of Bukit *et al.* (2023) and Peng (2021). Similarly, the high mean score for controlling communication reflects teachers' skill in managing classroom dynamics and guiding student behavior, aligning with previous research of Yadi (2021). While the moderate scores for challenging communication and non-verbal support indicate a moderate inclination towards stimulating critical thinking and using non-verbal cues effectively affirms with the studies of Engels (2021) and Li and Xue (2023), the moderate score for encouragement and praise suggests an area for improvement, essential for fostering a supportive learning environment as studies of Luckeydoo (2023) and Zhao (2019) affirms the idea that a positive reinforcement is considered crucial for fostering a supportive learning environment. Nevertheless, the high overall mean score for communication underscores teachers' proficiency in employing diverse communication strategies to support student learning, echoing previous research of Fauziah and Irmayanti, (2023) and Havik and Westergård (2020).

Student Engagement

Shown in Table 3, the level of student engagement in terms of affective engagement, behavioral engagement, and cognitive engagement which was the third objective of the study. The overall mean score of the level of student engagement was 4.45 and standard deviation 0.44, which was described as Very High. This signifies that the respondents' engagement was observed. Also show below, the indicator which have the highest mean score was affective engagement 4.49 and SD 0.48, with descriptive value of Very High. It was followed by cognitive engagement 4.34 and SD 0.63 described as Very High the lowest mean score is behavioral engagement 4.32 and SD 0.57 is interpreted again as Very High. The results exposed that the respondents' level of student engagement in terms of affective engagement, behavioral engagement, and cognitive engagement were Very High.

Table 3: Level of Student Engagement

Indicators	Mean	SD	Descriptive Level
Affective Engagement	4.49	0.48	Very High
Cognitive Engagement	4.34	0.63	Very High
Behavioral Engagement	4.32	0.57	Very High
Overall	**4.45**	**0.44**	**Very High**

The results imply that the grade 9 students of one of the junior high school in Davao del Sur Division are highly engaged affectively, cognitively, and behaviorally. With their level of engagement, these students manifest that they take ownership of their learning growth in ensuring academic progress. Affective engagement, the indicator with highest mean score, implies that these students strongly desire to learn; they enjoy learning new things in

class; they like thier school; they are happy to be at this school; and always looking forward in going to school.

The research findings reveal remarkably high levels of student Engagement across emotional, cognitive, and behavioral dimensions, indicating a deep investment in learning and motivation. The elevated mean scores for affective, cognitive, and behavioral engagement suggest that students are highly motivated, interested, and actively involved in their learning processes, This affirms the studies of Cents-Boonstra *et al.* (2021); Sambara *et al.* (2022) and Halverson and Graham (2019). A student's cognitive engagement with learning activities or materials is the best description of active learning, according to Bonwell and Eison (1991). The findings underscore the importance of fostering multifaceted engagement to create interactive, collaborative, and enriching educational environments conducive to both academic success and personal growth.

The Significance on the Relationship between Learning Environment and Student Engagement

Presented in Table 4 was the significant relationship between Learning Environment and Student Engagement in terms of community of peers, teacher and student relationships, academic climate, meaningful engagement, mentoring, inclusion and safety, and physical space and Student Engagement in terms of affective engagement, behavioral engagement, and cognitive engagement. The overall r-value is .592, while the p-value less than 0.05 level which rejects the null hypothesis. This implies that there was significant relationship between the two constructs. The data revealed that affective engagement had r-values ranging from .183 to .275 with the indicators of the learning environment. Behavioral engagement had correlation values between .249 and .469, and cognitive engagement had values from .275 to .429. All computed p-values leading to the rejection of the null hypothesis for each relationship. These results indicate the importance of emotional, behavioral, and cognitive engagement in connection to the various aspects of the learning environment, emphasizing the significance of these engagements in fostering a positive and supportive educational setting.

The self-determination theory posits that individuals have three innate psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2008). The data presented aligns well with this theory. The significant positive correlation between the learning environment and the various aspects of student engagement (affective, behavioral, and cognitive) suggests that the learning environment is likely supporting the fulfillment of these three basic needs. A supportive and positive learning environment can foster a sense of autonomy, where students feel they have some control and choice in their learning. Furthermore, a nurturing learning environment can promote a sense of relatedness, where students feel connected to their peers and teachers.

Table 4: Significance on the Relationship between Learning Environment and Student Engagement

Learning Environment	**Student Engagement**			
	Affective Engagement	**Behavioral Engagement**	**Cognitive Engagement**	**Overall**
Community of Peers	.183**	.249**	.275**	.301**
	.001	.000	.000	.000
Teacher and Student Relationships	.263**	.368**	.285**	.385**
	.000	.000	.000	.000
Academic Climate	.227**	.469**	.429**	.484**
	.000	.000	.000	.000
Meaningful Engagement	.213**	.409**	.429**	.453**
	.000	.000	.000	.000
Mentoring	.275**	.308**	.306**	.374**
	.000	.000	.000	.000
Inclusion and Safety	.256**	.358**	.375**	.421**
	.000	.000	.000	.000
Physical Space	.195**	.264**	.333**	.338**
	.001	.000	.000	.000
Overall	**.347****	**.520****	**.524****	**.592****
	.000	**.000**	**.000**	**.000**

**Significant at 0.05 significant level*

Bandura's social cognitive theory emphasizes the importance of environmental and personal factors in shaping an individual's behavior (Bandura, 2008). The data presented aligns with this theory, as the learning environment (an environmental factor) is shown to have a significant relationship with student engagement (a behavioral outcome).

The flow theory suggests that individuals experience

a state of optimal engagement and enjoyment when their skills are well-matched to the challenges they face (Csikszentmihalyi *et al.*, 2018). The data presented supports the relevance of this theory in the context of learning environments and student engagement. A learning environment that is well-designed and supportive can create the conditions for students to experience a state of flow. The significant positive correlations between the learning environment and the different aspects of student engagement (affective, behavioral, and cognitive) indicate that a well-designed learning environment can foster the conditions necessary for students to achieve a state of flow, leading to increased engagement and better learning outcomes.

The study's findings reveal a nuanced understanding of the intricate relationship between emotions, behaviors, thoughts, and the learning environment, aligning with previous research of Brandisauskiene (2021) and Fredricks *et al.*, (2019) emphasizing the importance of these interactions in fostering a positive educational setting. Affective engagement emerges as significantly connected to several factors such as peer relationships, teacher-student relationships, and the overall academic climate, underscoring the broad impact of emotional involvement on student engagement affirmed by the studies of Franklin and Harrington (2019); Karatas (2019) and Buenaventura (2023).

The Significance on the Relationship between Teacher Communication Behavior and Student Engagement

Displayed in table is the significant relationship between teacher communication behavior, such as challenging, encouragement, praise, non-verbal support, understanding, friendliness, and control, and student engagement in affective, behavioral, and cognitive aspects. The overall r-value is .611 with a p-value of .000, indicating a rejection of the null hypothesis and a significant relationship between teacher communication behavior and student engagement. Affective engagement showed correlations with challenging (.271), encouragement and praise (.211), non-verbal support (.818), understanding and friendliness (.333), and control (.240), all with p-values of .000. Behavioral engagement also had strong connections with teacher communication behavior, with correlations of .509 for overall engagement and significant correlations with challenging (.498), encouragement and praise (.269), non-verbal support (.453), understanding and friendliness (.393), and control (.317), all with p-values of .000.

Moreover, cognitive engagement exhibited a strong relationship with teacher communication behavior, with an overall r-values of .591 and a p-value of .000. Cognitive engagement correlated significantly with challenging (.417), encouragement and praise (.365), non-verbal support (.530), understanding and friendliness (.440), and control (.478), all with p- values of .000. These findings suggest a high level of student engagement due to the impactful teacher communication behavior present in the learning environment. The results highlight the importance of teacher communication behavior in facilitating high levels of student engagement across affective, behavioral, and cognitive aspects.

The study reveals a significant relationship between teacher communication behavior and student engagement across affective, behavioral, and cognitive domains, with a strong overall correlation coefficient of .611. Specifically, challenging behavior from teachers correlates positively with affective, behavioral, and cognitive engagement, along with encouragement and praise, non-verbal support, understanding, friendliness, and control.

Table 5: Significance on the Relationship between Teacher Communication Behavior and Student Engagement

Teacher Communication Behavior	**Student Engagement**			
	Affective Engagement	**Behavioral Engagement**	**Cognitive Engagement**	**Overall**
Challenging	.271**	.498**	.417**	.505**
	.000	.000	.000	.000
Encourage and Praise	.211**	.269**	.365**	.362**
	.000	.000	.000	.000
Non-verbal Support	.181**	.453**	.530**	.507**
	.002	.000	.000	.000
Understanding and Friendly	.333**	.393**	.440**	.494**
	.000	.000	.000	.000
Controlling	.240**	.317**	.478**	.446**
	.000	.000	.000	.000
Overall	**.325****	**.509****	**.591****	**.611****
	.000	**.000**	**.000**	**.000**

**Significant at 0.05 significant level*

These findings underscore the crucial role of teachers in fostering student engagement through challenging, encouraging, and supportive behaviors, emphasizing the importance of creating an inclusive and positive learning environment. The study's results align with Self-Determination Theory of Deci and Ryan (2008). The data reveals a significant positive correlation between various aspects of teacher communication behavior (challenging, encouragement and praise, non-verbal support, understanding and friendliness, and controlling) and the different dimensions of student engagement (affective, behavioral, and cognitive). This alignment suggests that teacher communication behavior plays a vital role in fulfilling students' basic psychological needs. For example, the positive correlations with encouragement, praise, and non-verbal support can foster a sense of competence and relatedness, while the correlation with control (or the lack thereof) can support students' autonomy. When these needs are met, students are more likely to be engaged and motivated in their learning.

The findings of the study agree with Social Cognitive Theory of Bandura (2008). The significant correlations between various aspects of teacher communication behavior and the different dimensions of student engagement (affective, behavioral, and cognitive) indicate that the teacher's communication style and actions can profoundly impact students' cognitive, emotional, and behavioral engagement in the learning process.

The study's results confirm with Flow Theory (Csikszentmihalyi, 2018). The data shows that teacher communication behavior, such as challenging, encouragement, and understanding, is positively correlated with student engagement. This aligns with the flow theory, as effective teacher communication can create the conditions for students to experience a state of flow. The strong positive correlations between teacher communication behavior and the different aspects of student engagement (affective, behavioral, and cognitive) highlight the importance of creating learning environments where teachers can effectively communicate and support students in a way that facilitates optimal engagement and flow experiences.

The study's results align with previous research of Reeve (2019); Wong and Liem (2022) and Quines and Relacion (2022) emphasizing the profound impact of teachers' behavior and beliefs on student engagement and learning outcomes, emphasizing the need for educators to cultivate supportive, credible, and caring environments conducive to student development and learning.

Regression Analysis of Learning Environment and Teacher Communication Behavior that Best Influences Student Engagement

Shown in Table 6 is the regression analysis of the collected data to test and analyze if there was a significant influence between independent and dependent variables namely the learning environment, teacher communication behavior and student engagement of the Grade 9 students in one of the National High School in Davao del Sur. Additionally, the model represents the computed F–value of 21.211 with corresponding p–value of .000 which was lower than 0.05 level of significance. Thus, the independent variables learning environment and teacher communication behavior significantly influences the dependent variable student engagement.

Further, R square is equal to .470 that implies a 47 percent of the variance on student engagement was significantly influenced by learning environment and teacher communication behavior while the remaining 53 percent have a significant relationship by the other aspects. Furthermore, there is one out of seven indicator of learning environment having a significant relationship to student engagement. On the other hand, there are two out of five indicators of teacher communication behavior having a significant relationship to student engagement.

Table 6: Regression Analysis of Learning Environment and Teacher Communication Behavior that Best Influences Student Engagement

Student Engagement					
		B	**β**	**t**	**Sig.**
Constant		1.486		6.969	.000
Learning Environment					
Community of Peers		.021	.030	.581	.562
Teacher and Student Relationships		-.029	-.044	-.739	.461
Academic Climate		.121	.149	2.613	.009
Meaningful Engagement		.062	.098	1.619	.107
Mentoring		.053	.079	1.513	.131
Inclusion and Safety		.077	.097	1.859	.064
Physical Space		.005	.009	.173	.863
Teacher Communication Behavior					
Challenging		.153	.201	3.469	.001
Encourage and Praise		-.041	-.068	-1.181	.239

Non-verbal Support		.080	.133	2.120	.035
Understanding and Friendly		.097	.153	2.613	.009
Controlling		.114	.154	2.937	.004
R	.686				
R^2	.470				
ΔR	.448				
F	21.211				
ϱ	.000				

The study examines the impact of different domains of the learning environment and teacher communication behaviors on student engagement. Results indicate that only the Academic Climate domain significantly influences student engagement, emphasizing the importance of instructional quality, academic support, and classroom environment. Additionally, teacher behaviors such as Challenging, Non-verbal Support, and Understanding and Friendly communication positively impact student engagement. However, Encourage and Praise and Controlling do not show significant influences. These findings underscore the importance of fostering a positive academic climate and employing effective teacher communication strategies to enhance student engagement and improve learning outcomes. This affirms with the study of Cooper (2020) and Bond *et al.* (2020). Furthermore, the study reveals a positive relationship between the learning environment and student engagement, emphasizing the need for conducive and supportive educational settings. The findings align with previous research of Li and Xue (2023); Quines and Relacion (2022); Miao *et al.* (2022); and Froment and de Besa (2022) highlighting the significance of teacher-student relationships, peer interaction, and student engagement for academic success and social development. The study contributes to a comprehensive understanding of the factors influencing student success in educational settings, emphasizing the role of the learning environment and teacher communication behaviors.

CONCLUSION

In conclusion, this research study has provided valuable insights into the connection between the learning environment, teacher communication behavior, and student engagement. The descriptive findings demonstrated that the overall level of the learning environment, teacher communication behavior, and student engagement were high, with student engagement being very high. The relationships between learning environment, teacher communication behavior, and student engagement were all statistically significant, with moderate to strong positive correlations. Furthermore, the regression analysis revealed that the learning environment and teacher communication behavior together accounted for a substantial proportion (47%) of the variance in student engagement, with both factors making unique and significant contributions to predicting student engagement.

RECOMMENDATIONS

In understanding of the previous results and conclusion, the succeeding commendation are presented.

To improve student engagement in the learning environment from high to very high in terms of meaningful engagement, the teachers are encouraged to play and active role in the students' engagement. It is crucial to create activities that encourage meaningful engagement. One effective approach is to gamify learning by incorporating elements of competition, rewards, and challenges into activities. Games have been shown to engage students both inside and outside the classroom.

To improve teacher communication behavior from high to very high, particularly in the areas of encouragement and praise, the teachers are motivated to hold a significant importance in the student's engagement. They can be exposed to training about properly preparing classroom to steer engagement in students. Teaching each day with positivity encourages students to forget partial struggles and get interested in the lessons being taught.

In order to improve student behavioral engagement, it is important for teachers and schools to provide opportunities for students to take part in improving school needs by respectfully suggesting what needs do they see that can help the institution become a place where they can feel at ease while learning. When a learner feels comfortable with the environment in learning and the teacher also makes him feel at ease, student engagement is achieved and a better result academically is observed.

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REFERENCES

Bandura, A. (2008). *Social cognitive theory.* Wiley Encyclopedia of Cognitive Science. https://doi.org/10.1002/9781405186407.WBIECS053

Bloomfield, J., & Fisher, M. J. (2019). Quantitative research design. *Journal of the Australasian Rehabilitation Nurses Association, 22*(2), 27–30.

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International Journal of Educational Technology in Higher Education, 17*(1), 1–30.

Brandisauskiene, A., Buksnyte-Marmiene, L., Cesnaviciene, J., Daugirdiene, A., Kemeryte-Ivanauskiene, E., & Nedzinskaite Maciuniene, R. (2021). Sustainable school environment as a landscape for secondary school students' engagement in learning. *Sustainability*. https://doi.org/10.3390/SU132111714

Brobo, M. A. (2022). Non-verbal communicative behavioral patterns of English teachers. *International Journal of Research Publications.* https://doi.org/10.47119/ijrp1001041720223522

Buenaventura, V. P. (2023). Teacher communication behavior and classroom environment as pedagogical factors to the culinary competence of senior high school students. *European Journal of English Language Teaching*. https://doi.org/10.46827/ejel.v8i1.4690

Bukit, S., Ramadhani, R., & Bukit, J. F. (2023). Study of elementary school teacher communication strategies in the learning process. *Journal Corner of Education, Linguistics, and Literature.* https://doi.org/10.54012/jcell.v2i4.140

Cayubit, R., & Francis, O. (2021). Why learning environment matters? An analysis of how the learning environment influences the academic motivation, learning strategies, and engagement of college students. *Learning Environments Research*. https://doi.org/10.1007/S10984-021-09382-X

Cents-Boonstra, M. A., Lichtwarck-Aschoff, E., Denessen, E., Aelterman, N., & Haerens, L. (2021). Fostering student engagement with motivating teaching: An observation study of teacher and student behaviours. *Learning and Instruction.* https://doi.org/10.1080/02671522.2020.1767184

Chapman, E. (2019). Alternative approaches to assessing student engagement rates. *Practical Assessment, Research, and Evaluation, 8*(1).

Cheng, T.-Y., Hu, Q., Xie, Q., Trigoni, N., & Markham, A. (2022). Meta-Sampler: Almost-universal yet task-oriented sampling for point clouds. *arXiv*. https://doi.org/10.48550/arXiv.2203.16001

Cooper, L. A., & Frantz, K. F. (2020). The relationship between classroom environment and student course attrition and perceptions of engagement.

Cristobal, J., Hermano, C., Ibana, J. B., James, M. G., Ligot, M. L., & Lampitoc, D. (2022b). Improving the Grade 9 students' engagement in online synchronous classes in English through interactive games. *American Journal of Education and Technology, 1*(1), 18–25. https://doi.org/10.54536/ajet.v1i1.326

Csikszentmihalyi, M., Montijo, M. N., & Mouton, A. R. (2018). Flow theory: Optimizing elite performance in the creative realm.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology*. https://doi.org/10.1037/A0012801

Engels, M. C., Spilt, J., Denies, K., & Verschueren, K. (2021). The role of affective teacher-student relationships in adolescents' school engagement and achievement trajectories. *Learning and Instruction, 75,* 101485.

E-Palli Publishers. (2024). View of enhancing student engagement and achievement in biology through interactive slide presentations. *E-Palli.com.* https://journals.epalli.com/home/index.php/ajet/article/view/2520/1255

Fauziah, V., & Irmayanti, I. (2023). Teacher communication style in achieving learning success in the classroom. *AURELIA: Jurnal Penelitian dan Pengabdian Masyarakat Indonesia.* https://doi.org/10.57235/aurelia.v2i2.733

Florescu, D. M. (2020). Implications of the learning environment on educational practices in early education. *Journal Plus Education.* https://doi.org/10.24250/jpe/2/2020/dmf

Franklin, H., & Harrington, I. (2019). A review into effective classroom management and strategies for student engagement: Teacher and student roles in today's classrooms. *Journal of Education and Training Studies.*

Fredricks, J. A., Reschly, A. L., & Christenson, S. L. (Eds.). (2019). *Handbook of student engagement interventions: Working with disengaged students.* Academic Press.

Froment, F., & de-Besa, M. G. (2022). The prediction of teacher credibility on student motivation: Academic engagement and satisfaction as mediating variables. *Revista de Psicodidáctica.* https://doi.org/10.1016/j.psicoe.2022.05.001

Halverson, L. R., & Graham, C. R. (2019). Learner engagement in blended learning environments: A

conceptual framework. *Online Learning, 23*(2), 145–178. https://doi.org/10.24059/olj.v23i2.1481

Hart, S. R., Stewart, K., & Jimerson, S. R. (2011). The Student Engagement in Schools Questionnaire (SESQ) and the Teacher Engagement Report Form-New (TERF-N): Examining the preliminary evidence. *Contemporary School Psychology, 15,* 67–79. https://doi.org/10.1007/BF03340964

Havik, T., & Westergård, E. (2020). Do teachers matter? Students' perceptions of classroom interactions and student engagement. *Scandinavian Journal of Educational Research, 64*(4), 488–507.

Jalal, H., Fayez, B., Shriedeh, M., & In'airat, M. (2023). Impact of classroom environment, teacher competency, information and communication technology resources, and university facilities on student engagement and academic performance. *International Journal of Information Management Data Insights*. https://doi.org/10.1016/j.jjimei.2023.100188

Johnson, A. L., Reschly, R. P., Martin, C. A., Pinzone, J. J., & Appleton, J. J. (2022). Student engagement in elementary school: Profiles and associated characteristics. *Journal of Educational Psychology*. https://doi.org/10.1080/10824669.2022.2112196

Jones, V. F., & Jones, L. S. (2019). *Comprehensive classroom management: Creating communities of support and solving problems* (11th ed.). Pearson.

Karatas, M., Varol, F., & Dogan, S. (2019). The effect of classroom physical environment on students' academic achievement. *Journal of Educational Sciences Research, 9*(1), 60–68.

Krahe, C., Escamilla-Fajardo, P., & López-Carril, S. (2021). The influence of teacher-student communication on the importance of physical education. *Facta Universitatis. Series Physical Education and Sport*. https://doi.org/10.22190/FUPES200916061E

Lee, J., Song, H. D., & Hong, A. J. (2019). Exploring factors and indicators for measuring students' sustainable engagement in e-learning. *Sustainability, 11*(4), 985.

Li, J., & Xue, E. (2023). Dynamic interaction between student learning behaviour and learning environment: Meta-analysis of student engagement and its influencing factors. *Behavioral Sciences*. https://doi.org/10.3390/bs13010059

Luckeydoo, W. T. (2023). Teachers' perceptions of communication influencing the teacher-student relationship in an online environment. *International Journal of Integrating Technology in Education*. https://doi.org/10.5121/ijite.2023.12101

Matos, D. A. S., Leite, W. L., Brown, G. T. L., & Cirino, S. D. (2014). An analysis of the factorial structure of the Teacher Communication Behavior Questionnaire with Brazilian high school science students. *Psicologia: Teoria e Pesquisa, 30*(2), 223–234. https://doi.org/10.1590/S0102-37722014000200012

Miao, J., Chang, J., & Ma, L. (2022). Teacher–student interaction, student–student interaction, and social presence: Their impacts on learning engagement in online learning environments. *Journal of Genetic Psychology*. https://doi.org/10.1080/00221325.2022.2094211

Mitchell, R., Myles, F., & Marsden, E. (2019). *Second language learning theories*. Routledge.

Nuan, L., Haodong, L., Lu, Z., Zhunan, W., & Jian, Z. (2021). Promoting student engagement in online learning through harmonious classroom environment. *Asia-Pacific Education Researcher*. https://doi.org/10.1007/S40299-021-00606-5

Osher, D., Neiman, S., & Williamson, S. (2019). School climate and measurement. *State Education Standard, 20*(2), 23.

Peng, C. (2021). The academic motivation and engagement of students in English as a foreign language classes: Does teacher praise matter?. *Frontiers in Psychology, 12,* 778174.

Qobilovna, A. M. (2023). Communicative competence as a factor of teacher's professional competency. *American Journal of Social Sciences and Humanity Research, 3*(09), 32–44.

Quantitative Descriptive and Correlational Research. (2023). https://doi.org/10.1093/oso/9780197639757.003.0012

Quines, L. A., & Relacion, M. C. D. (2022). The mediating effect of school climate on the relationship between teacher communication behavior and student engagement. *European Journal of Education Studies*. https://doi.org/10.46827/ejes.v9i11.4521

Reeve, J., Cheon, S. H., & Jang, H. R. (2019). A teacher-focused intervention to enhance students' classroom engagement. In *Handbook of student engagement interventions* (pp. 87–102). Academic Press.

Rui, L. (2023). Student engagement in the language classroom. In P. Hiver, A. H. AI-Hoorie, & S. Mercer (Eds.), *Bristol (UK): Multilingual Matters*. ISBN: 978-1-78892-359-0. https://doi.org/10.30827/portalin.vi39.24457

Rusticus, S. A., Pashootan, T., & Mah, A. Y. J. (2022). What are the key elements of a positive learning environment? Perspectives from students and faculty. *Learning Environments Research*. https://doi.org/10.1007/s10984-022-09410-4

Sambara, I. B., Fadlia, F., & Merina, D. (2022). An exploration of students' engagement in EFL classrooms. *English Education Journal*. https://doi.org/10.24815/eej.v13i2.25969

Shochet, R. B., Colbert-Getz, J. M., Levine, R. B., & Wright, S. M. (2013). Gauging events that influence students' perceptions of the medical school learning environment: Findings from one institution. *Academic Medicine, 88*(2), 246–252. https://doi.org/10.1097/ACM.0b013e31827bfa14

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85*(4), 571–581.

Smith, R. A., & Tinto, V. (2022). Unraveling student engagement: Exploring its relational and longitudinal character. *Journal of College Student Retention: Research, Theory & Practice*. https://doi.org/10.1177/15210251221098172

Tinto, V. (2022). Exploring the character of student persistence in higher education: The impact of perception, motivation, and engagement. In *Handbook of research on student engagement* (pp. 357–379). Cham: Springer International Publishing.

Trowler, V., Allan, R. L., Bryk, J., & Din, R. R. (2022). Pathways to student engagement: Beyond triggers and mechanisms at the engagement interface. *Higher Education, 84*(4), 761–777.

Visualizing the Equation for the Sample Correlation Coefficient. (2023). https://doi.org/10.31234/osf.io/gwu8b

Weisburd, D., Britt, C., Wilson, D. B., & Wooditch, A. (2020). Measuring association for scaled data: Pearson's correlation coefficient. In *Springer* (pp. 183–197). https://doi.org/10.1007/978-3-030-47967-1_14

Wong, Z. Y., & Liem, G. A. D. (2022). Student engagement: Current state of the construct, conceptual refinement, and future research directions. *Educational Psychology Review, 34*(1), 107–138.

Xie, F., & Derakhshan, A. (2021). A conceptual review of positive teacher interpersonal communication behaviors in the instructional context. *Frontiers in Psychology*. https://doi.org/10.3389/FPSYG.2021.708490

Yadi, S. (2021). The effect of teacher caring behavior and teacher praise on students' engagement in EFL classrooms. *Frontiers in Psychology*. https://doi.org/10.3389/FPSYG.2021.746871

Zepke, N. (2021). Mapping student engagement using a theoretical lens. *Teaching in Higher Education, 29*(1), 176–193. https://doi.org/10.1080/13562517.2021.1973406

Zhao, Y. (2019). Achievement emotions as mediators of teacher communication behavior and student participation: A model construction. *Proceedings of the International Conference on Systems Engineering and Modeling*. https://doi.org/10.2991/SEIEM-18.2019.96