

Learning Environment and Materials, and Academic Performance of Students in General Mathematics

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DOI: <https://doi.org/10.47772/IJRISS.2026.100700939>

Received: 30 July 2026; Accepted: 04 August 2026; Published: 18 August 2026

ABSTRACT

This descriptive-correlational study investigated the relationship between the learning environment, the availability of learning materials, and the academic performance of students in General Mathematics among 191 Grade 11 students at a public school in Negros Island Region for school year 2025-2026. Findings revealed a good learning environment and great availability of learning materials, while the students' academic performance reached a very satisfactory level. Correlation analysis indicated a significant relationship between the learning environment and academic performance, but no significant relationship between learning material availability and academic performance. These results suggest that while physical and instructional materials are adequate, the quality of the learning environment plays a more direct role in relation to mathematical grades in this context. The researcher recommends targeting noise mitigation to improve classroom focus and further optimizing environmental factors to help elevate student performance from the "Very Satisfactory" level into the "Outstanding" bracket.

Keywords: Academic Performance, Learning Environment, Materials, General Mathematics

INTRODUCTION

Mathematics continues to be a cornerstone of the modern curriculum, essential for fostering the critical thinking and analytical capabilities required in the 21st-century workforce (Sugiharti et al., 2026). According to the Department of Education (DepEd) K to 12 Curriculum Guide, General Mathematics in senior high school serves as a foundational subject that equips learners with essential concepts in functions, business mathematics, and logical reasoning needed for higher education and real-life applications. However, the 2022 Programme for International Student Assessment (PISA) results highlight a crisis in proficiency. Most students currently struggle to meet the basic mathematical literacy required for modern society (OECD, 2023).

Educational research consistently emphasizes that students' academic success is influenced not only by their abilities but also by external factors within the school setting. One major factor is the learning environment. The Department of Education (DepEd), through DepEd Order No. 21, s. 2019, underscores that a conducive learning environment is essential for the effective delivery of the K to 12 curriculum. Research supports this, as studies have shown that a positive Classroom Learning Environment (CLE) correlates directly with improved mathematics performance, particularly when it fosters student cohesion, task orientation, and cooperation (Acoba and Ariola, 2025).

Complementing this environment is the use of instructional materials, which provide essential scaffolding for abstract concepts. While DepEd Order No. 12, s. 2020, prioritizes resource access for learning continuity, UNESCO (2021) argues that effectiveness depends on a combination of accessibility, content quality, and pedagogical support. Without these elements, materials cannot successfully bridge the gap between theory and practical understanding.

However, despite these national policies, local school settings often face persistent challenges, such as shortages in updated resources or classroom conditions that make it hard for students to concentrate. As noted in recent studies on mathematics learners in the Philippines, these gaps are often where performance begins to slip (E-Saliksik, 2025).

In a public school in Negros Island Region, these challenges remain a pressing reality. While faculty and administrators are continuously working to improve student outcomes in General Mathematics, there remains a critical need to understand how the school's specific learning environment conditions and resource availability of learning materials correlate with student's academic performance.

This study sought to determine the status of learning environment; availability of learning materials and where improvements can be made. Furthermore, it investigated the relationship between these factors and academic performance, providing the school with a clearer roadmap for supporting student success.

METHODOLOGY

Research Design

This study utilized a descriptive-correlational research design. According to Bhat (2024), descriptive-correlational research is a type of design that seeks to explain the relationship between two or more variables without making claims about cause and effect.

The descriptive aspect of this study described the status of the learning environment, the extent of availability of learning materials, and the students' level of academic performance. Meanwhile, the correlational component focused on determining the relationship between the learning environment and academic performance, as well as the link between the availability of learning materials and student outcomes.

Subject and Respondents of the Study

The subject and respondents of this study were the Grade 11 Senior High School students at a public school in Negros Island Region. These individuals were selected as respondents because they were directly engaged with the General Mathematics curriculum, the specific learning materials, and the classroom environment currently being evaluated.

Population and Sample Size

The population for this study was comprised of 362 Grade 11 students enrolled at a public school in Negros Island Region for the school year 2025–2026. To determine the appropriate sample size, Yamane's formula was applied, yielding a required sample of 191 Grade 11 students as respondents.

Data Gathering Instrument

The primary tool for this study was a researcher-modified survey questionnaire. The items concerning the Learning Environment were adapted from the studies of Pajarillo-Aquino (2019) and Aban and Caliba (2025), while the items regarding the Availability of Learning Materials were adapted from the study of Rabanes and Paglinawan (2025).

These instruments were revised by the researcher to better suit the specific context of Grade 11 students at a public school in Negros Island Region.

All responses were recorded using a five-point Likert Scale, ranging from "Strongly Agree" (5) to "Strongly Disagree" (1). Furthermore, data regarding the Academic Performance of the students were obtained through their official General Mathematics grades from the first and second quarters of the current school year.

Data Analyses

The weighted mean was computed to determine the status of the learning environment, the extent of availability of learning materials, and the level of students' academic performance. Sample standard deviation was used to measure the variability, spread, and consistency of the gathered responses. Students' academic performance was interpreted in accordance with DepEd Order No. 8, s. 2015. To examine significant relationships—between the learning environment and academic performance, and between the availability of learning materials and academic performance—Spearman's Rank-Order Correlation (Spearman's Rho) was employed at a 0.05 level of significance.

RESULTS AND DISCUSSION

This section includes the presentation of data gathered and the discussion, interpretation, and implication of the findings of the study. The results were presented in tables, which were then analyzed and interpreted. The order of the presentation follows the sequence of the problems identified in the study.

Status of the Learning Environment

Table 1 below shows the status of the learning environment in a public school in Negros Island Region.

Table 1. Status of the Learning Environment.

Statements	Mean	SD	Interpretation
1. Most of my classes are interesting.	3.97	0.59	Good
2. I feel understood by my teachers in most of my classes.	3.96	0.64	Good
3. I always understand the lessons.	3.59	0.76	Good
4. My teachers are easy to talk to.	4.09	0.75	Good
5. I am often called on to answer questions.	3.53	0.81	Good
6. When class starts, I am ready to learn.	4.09	0.75	Good
7. My teachers give me time to practice what is being taught.	3.96	0.74	Good
8. I feel free to say, "I don't understand."	3.85	0.91	Good
9. Teachers at my school like working with all learners.	3.96	0.65	Good
10. My teachers grade fairly.	3.92	0.97	Good
11. The classrooms are bright enough for teaching-learning activities.	4.04	0.95	Good
12. The classroom has enough seats and desks for every student.	4.01	0.77	Good
13. Our classroom is free from noise that helps us concentrate and understand the lesson content.	2.77	1.05	Fair
14. In school, my classmates are supportive when I encounter difficulty answering questions in class.	3.76	0.89	Good
15. I feel safe when I'm in school	4.02	0.82	
LEARNING ENVIRONMENT (As a whole)	3.84	0.41	Good

As shown in Table 1, the level of the learning environment in a public school in Negros Island Region was analyzed using the mean and standard deviation as the primary statistical measures. The data reveals an overall mean of 3.84, which falls under the good interpretation, indicating that the learning environment was generally favorable and supportive. Furthermore, the low overall standard deviation (SD = 0.41) indicates a high level of consensus among the students, demonstrating that most participants shared similar favorable experiences regarding their school environment. Each indicator reflected a particular dimension of the learning environment that supported or hindered student learning, providing a detailed view of the students' daily academic experience. Additionally, the highest-rated items (M = 4.09, SD = 0.75) were Statement 4, "My teachers are easy to talk to," and Statement 6, "When class starts, I am ready to learn," suggesting that students feel a strong sense of support from their teachers and possess a high level of personal motivation to begin their lessons.

This implies that the school has successfully built a foundation of trust and motivation, which provides a strong starting point for academic success. These high ratings are consistent with the study of Medado and Andales (2025), who noted that the social warmth of teacher-student relationships is a vital component of the learning environment. Furthermore, the students' readiness to learn supports the assertion of Gaisiey et al. (2025) that the environment is a multidimensional experience involving a crucial 'psychological' layer that prepares the mind for academic engagement.

On the other hand, the lowest-rated item ($M = 2.77$, $SD = 1.05$) is Statement 13, "Our classroom is free from noise that helps us concentrate and understand the lesson content," which falls under a fair interpretation. This suggests that excessive noise is a significant factor that hinders the students' ability to concentrate and fully understand the lesson content. This implies that unless the school addresses acoustic distractions, the students' high motivation and teacher support may not be enough to reach their full potential in Mathematics.

This finding is supported by Bustamante-Mora et al. (2025), who emphasized that in technical subjects like Mathematics, noise can easily disrupt the 'logical flow' required for problem-solving. Furthermore, as Gaisiey et al. (2025) suggested, because the environment is a multidimensional experience, this physical distraction may prevent the 'silent partner' of learning from effectively supporting the students' academic growth.

Extent of Availability of Learning Materials

Table 2 below shows the extent of availability of learning materials in a public school in Negros Island Region.

Table 2. Extent of Availability of Learning Materials of Students when taken as a Whole and in terms of Accessibility of Materials, Quality of Materials, and Support for Using Materials.

Statements	Mean	SD	Interpretation
Accessibility of Materials	3.62	0.51	Great
1. I can easily access the instructional materials needed for my studies (e.g., minimal effort, online access).	3.74	0.78	Great
2. The materials are available in multiple formats (e.g., print, digital).	3.71	0.77	Great
3. The materials are up-to-date and relevant to the current curriculum (e.g., updated within the last 2 years).	3.70	0.66	Great
4. I can obtain supplementary resources (e.g., textbooks, online content) easily.	3.68	0.78	Great
5. The school library has a sufficient collection of mathematics materials.	3.45	0.81	Great
6. I have access to instructional materials outside of class hours (e.g., online platform).	3.48	0.88	Great
7. The instructional materials are easy to search.	3.56	0.86	Great
8. I can access materials that cater to diverse learning styles and needs.	3.61	0.73	Great
Quality of Materials	3.92	0.44	Great
9. The instructional materials are engaging and interactive (e.g., quizzes, simulations).	3.83	0.68	Great
10. The quality of the materials enhances my understanding of mathematics concepts.	3.75	0.74	Great
11. The materials include real-world applications relevant to my studies.	3.81	0.72	Great
12. I find the visuals in the instructional materials helpful for learning (e.g., diagrams, graphs, videos).	4.07	0.70	Great
13. The content is accurate and well-researched.	3.92	0.67	Great
14. The instructional materials promote critical thinking skills effectively (e.g., problem-solving, analysis tasks).	4.00	0.61	Great
15. I find the assessments included in the materials useful for my learning progress (e.g., quizzes, assignments, exams).	4.04	0.58	Great
16. The language used in the learning materials is clear and easy to understand.	3.96	0.68	Great

Support for Using Materials	3.85	0.46	Great
17. Faculty provide guidance on selecting appropriate resources for assignments.	3.79	0.72	Great
18. Faculty encourage the use of various available resources in their teaching methods.	3.84	0.63	Great
19. Technical support is readily available for digital resources.	3.71	0.76	Great
20. There are clear instructions provided with the instructional materials.	3.95	0.63	Great
21. I am aware of all available resources that can aid my learning through announcement or emails.	3.79	0.77	Great
22. There are "User Guides" or manuals available for complex learning materials.	3.80	0.66	Great
23. Support is provided for students who need alternative versions of materials (e. g., printed copies for those without internet).	4.00	0.68	Great
24. The guidance provided increases my confidence in using learning materials independently.	3.91	0.70	Great
LEARNING MATERIALS (As a whole)	3.79	0.41	Great

Legend: (4.21-5.00)-Very Great; (3.41-4.20)-Great; (2.61-3.40)-Moderate; (1.81-2.60)-Low; (1.00-1.80)-Very Low

As shown in Table 2, the level of learning materials of students was analyzed using the mean and standard deviation as the descriptive statistical measures. The extent of availability of learning materials in a public school in Negros Island Region reveals an overall mean of 3.79, which falls under the great interpretation. This indicates that General Mathematics resources were largely accessible and of good quality. Furthermore, the low overall standard deviation ($SD = 0.41$) indicates a high degree of consistency in the students' responses, demonstrating a shared consensus regarding the utility and availability of these educational resources. This score suggests that the institution effectively provides the necessary tools and resources to support student learning across various dimensions, specifically in terms of accessibility, quality, and support. Among the three categories, the Quality of Materials garnered the highest mean ($M = 3.92$, $SD = 0.44$), highlighted by the finding in Statement 12 that visuals such as diagrams, graphs, and videos are particularly helpful for learning ($M = 4.07$, $SD = 0.70$). These results further supported the interpretation that the mathematical resources provided to the students were of a standard that facilitated effective academic engagement.

This result aligns with the findings of Okafor (2024), who noted that in technical subjects like Mathematics, tangible learning aids and visual instruments are essential for reaching higher levels of mastery.

Furthermore, the highly rated item, Statement 15 ($M = 4.04$, $SD = 0.58$), "I find the assessments included in the materials useful for my learning progress (e.g., quizzes, assignments, exams)," reflects the assertion of Nwafor et al. (2024) that well-structured resources serve as a foundation for a student's mental development and academic success.

On the other hand, while still interpreted as great, the Accessibility of Materials ($M = 3.62$, $SD = 0.51$) and Support for Using Materials ($M = 3.85$, $SD = 0.46$) show slightly lower averages. In looking closely at individual item means, a lower average is specifically observed in Statement 5 regarding the sufficiency of the mathematics collection in the school library ($M = 3.45$, $SD = 0.81$). This finding highlights a potential "resource gap" similar to that observed by Rabanes and Paglinawan (2025), suggesting that while general mathematics materials are available, specialized tools are critical for deeper engagement.

The overall results imply that the school has successfully established a rich variety of resources which, according to Nyirandimukaga and Manizabayo (2021), helps students develop a stronger belief in their own academic capabilities. Ultimately, this data suggests that the presence and quality of these materials act as a "map" for the students' difficult journey through General Mathematics, providing the foundation needed to turn abstract formulas into understandable concepts.

Level of Academic Performance

Table 3 below shows the level of academic performance of students in a public school in Negros Island Region.

Table 3. Level of Academic Performance of the Students.

Level of Academic Performance	f	Mean	SD	Interpretation
Outstanding	78	88.16	5.13	Very Satisfactory
Very Satisfactory	74			
Satisfactory	24			
Fairly Satisfactory	13			
Did Not Meet Expectations	2			
Total	191			

Legend:(90-100)-Outstanding; (85-89)-Very Satisfactory; (80-84)-Satisfactory; (75-79)-Fairly Satisfactory; (below 75)-Did Not Meet Expectations

As shown in Table 3, the level of academic performance of students in a public school in Negros Island Region was evaluated utilizing the mean and standard deviation as the descriptive statistical tools. The data reveals an overall mean score of 88.16, which falls under the "Very Satisfactory" interpretation. The standard deviation (SD = 5.13) indicates a moderate variance in student grades, suggesting that while individual scores fluctuated above and below the average, the majority of learners still performed within or close to the 'Very Satisfactory' bracket. This result indicates that the Grade 11 learners have achieved a high level of proficiency in their subject matter, particularly in General Mathematics. The "Very Satisfactory" rating further suggests that despite the environmental challenges identified in Table 1, such as noise distractions, the students have managed to maintain strong academic standing.

This high level of performance aligns with the study of Medado and Andales (2025), who observed "high" student grades in Philippine extension schools when physical essentials and social warmth are balanced.

This supports the assertion of Adolfo and Ducot (2025) that while a well-kept classroom is vital, academic excellence in the public school system is often influenced by a complex web of factors beyond just the physical design of the room.

The result implies that the students possess a strong foundational understanding of the curriculum and are effectively utilizing the available "High" quality learning materials (as shown in Table 2) to succeed. However, maintaining this "Very Satisfactory" performance requires continuous support, as Barcarse (2024) reminds us that a student's ability to succeed is naturally tied to the consistent availability and quality of their learning resources.

Relationship Between the Learning

Environment and Students' Academic Performance

Table 4 below shows the relationship between the learning environment and students' academic performance in General Mathematics.

Table 4. Relationship between Learning Environment and Academic Performance.

Variable	Test Statistics (r_s)	p-value	Decision for H_0	Interpretation
Learning Environment vs. Academic Performance	0.174*	0.016	Reject H_0	Significant

As shown in Table 4, a statistical analysis using Spearman's rho (r_s) was conducted to test the null hypothesis that there is no significant relationship between the learning environment and students' academic performance. The data reveals a correlation coefficient of $r_s = 0.174^*$ with a corresponding p-value of 0.016. Because the p-value is less than the standard significance level, the relationship between the learning environment and academic performance is statistically significant; therefore, the study rejects the null hypothesis.

The rejection of the null hypothesis suggests that the physical and social dimensions of the learning environment serve as a meaningful factor connected to academic achievement in General Mathematics. This implies that improvements in the classroom atmosphere, reduction of environmental distractions, and teacher-student dynamics have a tangible, positive relationship with student grades. While the correlation coefficient ($r_s = 0.174^*$) indicates a weak positive relationship, it confirms that a supportive environment provides a vital structural framework that runs parallel to the students' internal motivation and readiness to learn.

This significant relationship aligns with the global perspectives of Niazi et al. (2024) and Bustamante-Mora et al. (2025), who view the surrounding environment as a primary driver and supporting pillar of academic success. Even though local realities in a public school in Negros Island Region demand high student resilience due to situational challenges like noise, the statistical data emphasizes that physical and psychological comforts are not completely isolated from student outcomes. Ultimately, creating a more favorable learning atmosphere acts as an essential catalyst, helping Grade 11 learners maximize their potential and sustain their "Very Satisfactory" academic performance in technical subjects like Mathematics.

Relationship Between the Availability of Learning

Materials and Students' Academic Performance

Table 5 below shows the relationship between the availability of learning materials and students' academic performance in General Mathematics.

Table 5. Relationship between the Learning Materials and Academic Performance.

Variable	Test Statistics (r_s)	p-value	Decision for H_0	Interpretation
Learning Materials vs. Academic Performance	0.076	0.298	Failed to Reject H_0	Not Significant

As shown in Table 5, a statistical analysis using Spearman's rho (r_s) was conducted to test the null hypothesis that there is no significant relationship between learning materials and students' academic performance. The data reveals a correlation coefficient of $r_s = 0.076$ with a corresponding p-value of 0.298. This results in a decision to fail to reject the null hypothesis, indicating that the relationship between learning materials and academic performance is not statistically significant.

The implication of this non-significant relationship is that while the availability and quality of materials are rated as great at a public school in Negros Island Region, these resources only serve as a "map" for the students' journey. Their effectiveness as a catalyst for mental growth ultimately requires the "human element"—specifically, the strategic pedagogical application by the teacher and the intrinsic motivation of the student.

The failure to reject the null hypothesis suggests that simply having materials available does not automatically guarantee higher grades for Grade 11 learners in General Mathematics. This finding aligns with the observations of Kibirige, Lutalo, and Christopher (2025), who noted a "performance gap" where grades remained low despite the presence of the right tools, concluding that success depends more on how teachers weave those materials into daily instruction. Furthermore, this result mirrors the study of Medado and Andales (2025) in the Philippines, which suggested that student success is often influenced by a complex web of factors that do not always move in a perfect line with physical resources.

CONCLUSION

Based on the findings, the following conclusions are drawn: the status of the learning environment at a public school in the Negros Island Region is favorable and supportive; General Mathematics learning materials are largely accessible and of good quality; students demonstrate very satisfactory performance in General Mathematics; the learning environment serves as a significant determinant of academic performance; and the availability of learning materials does not guarantee higher academic performance.

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