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Junior High School Students Science and Mathematics Academic Performance in Relation to Their GRACE-PASS Scores: A Basis for the Development of Intervention Program

Angelica D. Mateo[1]; Nivealyn S. Cruz[2] ; Bryan DC. Gabriel, PhD

[123]Graduate School Department, Bulacan Agricultural State College

ABSTRACT.

This study investigates the correlation between GRACE-PASS scores and academic performance in science and mathematics among junior high school students, of Colegio de Sta Monica de Angat aiming to inform the development of targeted intervention programs. Using documentary analysis, the research explores students' learning competencies and provides insights into school academic performance in Science and Mathematics. The researchers selected five hundred fifty (550) Junior High School students in different grade levels, through stratified sampling method. The findings highlight significant variations in correlation patterns across different grades and subjects. Notably, Grade 9 and Grade 10 consistently demonstrated strong positive correlations between GRACE-PASS scores and academic performance in both Mathematics and Science. Higher GRACE-PASS scores were consistently associated with better academic outcomes in these grades. In contrast, Grade 7 and Grade 8 exhibited more varied results, with some correlations reaching statistical significance while others did not.These findings underscore the importance of tailored educational interventions and curriculum adjustments based on GRACE-PASS assessments to enhance student learning outcomes. Recommendations include the implementation of targeted support programs for students identified with lower GRACE-PASS scores, curriculum revisions to align teaching with assessment objectives, and ongoing professional development for educators to effectively interpret and utilize assessment data.

Keywords *– (PASS, academic performance, Document Analysis, correlation, intervention, analysis)*

I. INTRODUCTION

Context and Rationale

Junior High School marks a crucial phase in students' educational journey, particularly in shaping their understanding of fundamental concepts in Science and Mathematics. During this pivotal period, adolescents transition from basic arithmetic and scientific principles to more advanced topics such as algebra, chemistry, and physics. However, the learning process can pose significant challenges for many students. Some may encounter difficulties due to different factors like cognitive development, learning disabilities, or socio-economic constraints that may affect their access to long-term learning. These obstacles can manifest as struggles in grasping abstract concepts, solving mathematical problems, or comprehending scientific theories. Moreover, the academic pressure to excel can intensify these difficulties, potentially leading to disengagement or frustration among students. Recognizing these challenges is essential as it emphasizes the necessity for targeted interventions and supportive educational approaches for our learners. Anticipating a student's academic performance is essential for providing timely support to those at risk, ensuring their retention, and enhancing the overall quality of learning materials and experiences, consequently improving the school's ranking and reputation (Mahmoud, 2019).By identifying and addressing these issues early on, educators can foster a more inclusive and effective learning environment that empowers all students to thrive in Science and Mathematics, establishing a strong foundation for their future academic pursuits.

Standards-Based Assessment (SBA) is a viable tool that can be used for identifying students academic knowledge, teachers efficacy and the school's progress (Pietromonaco, 2021). This can also be used as an indicator whether there's a need for curriculum planning or revisions, differentiating instructions, and identifying students' academic strengths and weaknesses. Taking into account the importance of academic performance, especially in the three major subjects such as English, Math, and Science, it is of utmost importance that educators be able to ensure that our learners are able to attain the required competencies provided by the Department of Education in order to produce proficient and globally-competent graduates.

Global Resources for Assessment Curriculum and Evaluation, Inc. (GRACE) specializes in research and test development, focusing on quality standards-based assessment in the Philippines. They are committed to delivering superior, relevant, and comprehensive assessments, GRACE provides valid and reliable assessment reports that help schools make sound and informed decisions to improve student learning outcomes anchored on the prescribed K-12 standards of the Department of Education (DepEd). GRACE offers different assessment tools in order to measure students' performance in different aspects. One of these assessment tools is the Performance Assessment of Standards and Skills (PASS) which is a standards-based assessment tool

developed by GRACE designed to measure the proficiency level of students in the competencies and standards set by the Department of Education (DepEd).

With the purpose of measuring whether the school was able to accomplish its goal to deliver learning and instructions that are in compliance with the set standard of the Department of Education, Colegio de Sta Monica de Angat (CSMA) availed the services of Global Resources for Assessment Curriculum and Evaluation, Inc - Performance Assessment of Standards and Skills (GRACE-PASS) to administer a standardized assessment. Through these services, the mastery level of the required competencies to be learned by the students are assessed. Pupil's school performance gauge effectiveness and guide school administrators to come up with a framework for understanding the correlation between curricular alignments and pupil's performance (Gallares, et al., 2023). This research aims to study the correlation between the academic performance and the student's GRACE-PASS scores of the Grades 7 to 10 students from CSMA for the school year 2023-2024.

A major concern for the Junior High School students and teachers at Colegio de Sta. Monica de Angat is how to be able to get a better performance rating for Science and Mathematics based on their GRACE-PASS scores since very few students very seldom reach the proficient level in their GRACE-PASS result. With this, the researchers aimed to find out the possible factors which contributed to the gap between the students' academic performance and their GRACE-PASS Post Test Result.

This study provides valuable insights into the effectiveness of GRACE-PASS assessments in predicting students' cognitive and academic skills within Science and Math subjects, thereby validating their utility as diagnostic tools. This research also identifies specific areas of strength and weakness among students, offering educators a targeted approach to developing interventions that address individual learning needs more effectively. Moreover, by correlating academic performance with GRACE-PASS scores, the study contributes to a deeper understanding of factors influencing students' success in Science and Mathematics during this critical developmental stage. Ultimately, these findings can inform evidence-based educational practices, guiding curriculum adjustments, instructional strategies, and resource allocations aimed at improving overall educational outcomes for Junior High School students in Science and Mathematics.

Review of Related Literature and Studies Predictive Modelling

Mahmoud (2019) developed a predictive model to examine the impact of academic performance on the National Achievement Test (NAT). The constructed model was utilized to identify predictive features within academic subjects that affect NAT scores, assess the influence of different academic subjects on NAT outcomes, pinpoint subjects with a substantial impact on NAT scores, and investigate whether academic performance across quarters correlates with NAT scores.

Regio et al. (2021) developed a predictive model to forecast participant performance and identify the key factors influencing exam results. Utilizing readily available data from the Ministry of Education, they employed the Logistic Regression approach. Their predictive model achieved an accuracy rate of 74% in inferring student performance. Importantly, by opting for a straightforward statistical model over complex Machine Learning techniques, the researchers ensured that school administrators could easily interpret and utilize the results, even without an in-depth understanding of the analytical method employed.

Potential Interventions

Nugrahanto, Septya and Zuchdi (2019) examined the impact of Indonesia's PISA results on the reading learning program. While the study focused on reading, the results provide insights into the potential impact of targeted interventions on academic performance in various subjects, including science and mathematics.

Popham (2020) examined how teachers utilize standardized test data to inform their instructional practices and improve student learning outcomes. Popham investigates the ways in which educators interpret and apply assessment results in their teaching, focusing on the challenges and successes they encounter in the process.

McGee and Lin (2021) investigated the effectiveness of targeted interventions designed to improve standardized test performance among elementary school students. The researchers implemented various instructional strategies and support systems aimed at addressing specific learning gaps identified through prior assessments. The study focused on a diverse group of students from different socioeconomic backgrounds, allowing for an evaluation of how these interventions could bridge achievement gaps.

Attitudes, Study Habits, and Academic Performance

Valentine et al. (2020) assessed the attitudes of secondary school students towards test-taking in the Afikpo Education Zone of Ebonyi State, Nigeria. They recognized that students' attitudes can significantly influence their performance and overall educational experience. The researchers explored various factors that contribute to how students perceive and approach tests.

Walck-Shannon et al. (2021) investigated the relationship between study habits and academic performance among students. The study supported that effective study habits are crucial for academic success, the research determined how various study practices correlate with students' performance in their educational pursuits

Etcuban et al. (2024) investigated the attitudes, study habits, and academic performance of junior high school students in mathematics. The study highlighted the significant influence of students' attitudes and study habits on their academic performance, emphasizing the role of non-cognitive factors

in shaping students' achievement. However, the specific impact of attitudes and study habits on students' academic performance in science, as well as their performance on national achievement tests, warrants further exploration.

Students' Attitudes Towards Standardized Testing

Gard (2020) discussed the standardized testing bias which includes the prevalence of testing bias as well as the causes and types of testing bias. Testing bias can be caused by a large variety of factors such as socioeconomic status, language spoken, prior knowledge, students' experiences, and home "culture". Testing bias can be categorized as economic bias, gender bias, or racial bias. Students' attitudes towards testing are also explored. The literature review seeks to focus on students' view of standardized testing and how they can be given a voice to share those views in school.

Conceptual Framework

This conceptual framework provides a structured approach to investigating how the Grades 7 to 10 educational practices and interventions to support students' learning and academic performance in Science and Mathematics may affect the GRACE-PASS scores for the students. And in turn, the result of these can be used to develop an applicable intervention program.

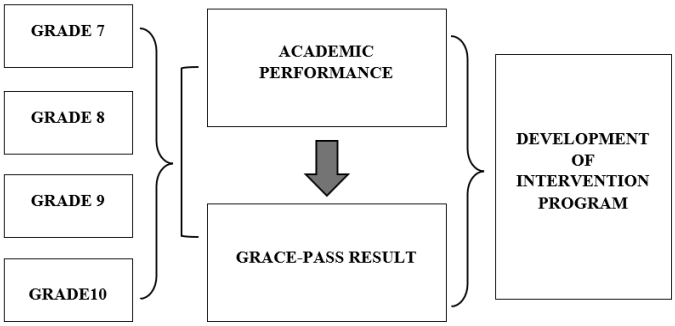

Figure 1. Conceptual Framework

Research Questions

This study aims to investigate how Junior High School students' academic performance correlates with their GRACE-PASS scores in Science and Mathematics at Colegio de Sta Monica de Angat.

Specifically, this research aims to address the following research questions:

1. Are there significant differences between the academic performance and the GRACE-PASS result in Mathematics and Science of:

1.1 the different grade 7 sections

1.2 the different grade 8 sections

1.3 the different grade 9 sections

1.4 the different grade 10 sections

2. What are the patterns and variations in the relationship between academic performance and GRACE-PASS scores in Mathematics and Science across different grade levels and sections?

3. What intervention programs can be developed in order to improve the GRACE-PASS performance of the students based on the result of the study?

Hypotheses

This study was guided and tested by the following hypotheses:

1. There is no significant correlation between the academic performance and GRACE-PASS scores in Mathematics among Junior High School students.

2. There is no significant correlation between academic performance and GRACE-PASS scores in Science among Junior High School students.

Significance of the Study

The significance of this study lies in its potential to enhance understanding of the academic landscape for Junior High School students, particularly in Science and Mathematics. By exploring the relationship between academic performance and GRACE-PASS scores, this research aims to provide valuable

insights that can lead to improved educational outcomes through targeted intervention programs. Educators will benefit from evidence-based findings that inform instructional strategies, allowing them to tailor their approaches to meet diverse student needs. Additionally, the study may guide policymakers in shaping curricular and assessment policies that align with the cognitive assessments' predictive capabilities. Ultimately, by identifying key factors that contribute to academic success, this research may foster greater student engagement and motivation, while also contributing to the existing literature on educational assessments and their impact on student performance.

II. METHODS

Research Design

This study employed a quantitative research design to investigate the relationship between Junior High School students' academic performance and their GRACE-PASS scores in Science and Mathematics. A descriptive-correlational research design will be utilized to explore the strength and direction of the relationship between these variables.

Respondents and Sampling

The respondents of this study were the Junior High School Students of Colegio de Sta Monica de Angat. This study aims to investigate how Junior High School students' academic performance correlates with their GRACE-PASS scores in Science and Mathematics. The respondents were selected using stratified sampling techniques in which the population of Junior High School students were stratified based on grade level then used proportionate sampling to maintain correct representations from each grade level.

Instrumentation

The instrumentation for this study involved the use of two primary tools: the GRACE-PASS assessment and academic performance records in Science and Mathematics.

The GRACE-PASS assessment is a standardized tool intended to assess students' cognitive skills, preferred learning styles, and readiness for academic challenges. It generates a detailed score that highlights individual strengths and weaknesses of the students across various cognitive domains for a specific subject. The data was sourced from records sent by GRACE to the school after conducting the post test in order to maintain its relevance and timeliness. The students' performance in Science and Mathematics was evaluated through their grade point averages (GPAs) or final grades from the latest academic year, which was retrieved from the official school documentation in order to ensure precision and trustworthiness. This quantitative evaluation of student success in these key subjects will facilitate an examination of how GRACE-PASS scores correlate with their academic performance.

Data Gathering Procedure

The data gathering process for this study was systematic and organized to ensure the reliability and validity of the findings. GRACE-PASS assessment scores were collected from official school records. The researchers collaborated with school administrators to access this data while ensuring compliance with privacy regulations and ethical standards. Academic performance in Science and Mathematics were assessed by collecting students' grade point averages (GPAs) or final grades from the most recent academic year. This data was also obtained from school records and it provided a quantitative measurement of students' achievements in these subjects. Once all the data was collected, it was entered into statistical analysis software such as Jamovi for analysis. Descriptive statistics was calculated, and correlation coefficients were used to explore the relationships between academic performance and GRACE-PASS scores in Science and Mathematics.

Ethical Considerations

In conducting the research, the following ethical considerations were upheld to ensure the integrity of the research process, a letter of request for data gathering and access for the official school records both for the students' Math and Science final grades and their GRACE-PASS Post-test result was submitted and duly signed by the School Principal. Personal identifiers have been removed from all data collected, and individual records were aggregated to ensure anonymity. Data was stored securely and accessed only by authorized personnel involved in the research.

The results of the study were used to inform the development of intervention programs that aimed to enhance the academic performance of the junior high school students, with a commitment to disseminating findings in a manner that benefits the educational community while respecting the interests of the participants. Finally, efforts have been made to ensure that the study is inclusive. By adhering to these ethical considerations, the research aims to contribute valuable insights into the academic performance of the students while safeguarding their rights and well-being throughout the study.

Data Analysis

The data analysis for this study has been conducted using statistical analysis software, such as Jamovi, to ensure accurate interpretation of the collected data. The academic performance records and GRACE-PASS scores in Science and Mathematics were analyzed to identify trends and patterns. To examine the relationship between cognitive abilities, as measured by the GRACE-PASS assessment, and academic performance, Pearson's correlation coefficients were calculated. This will help determine the strength and direction of the relationship between the two variables.

III. RESULTS AND DISCUSSION

Table 1. The Correlation Between Academic Performance and Result of GRACE-PASS in Mathematics in the Grade 7 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
7A	*0.735***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
7B	*0.724***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
7C	*0.651***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
7D	*0.476**	*0.016*	*Significant*	*Reject the Null Hypothesis*
7E	*0.287*	*0.156*	*Not Significant*	*Do not Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

The study investigated the correlation between Junior High School students' academic performance and their GRACE-PASS scores in Science and Mathematics. Pearson's correlation coefficients were calculated to assess the strength and direction of these relationships.

Table 1 illustrates the correlation between academic performance and the GRACE-PASS results in Mathematics for Grade 7 students. The Pearson's r values demonstrate varying degrees of correlation across different grade sections. Grades 7A, 7B, and 7C exhibit strong correlations, with values of 0.735, 0.724, and 0.651, respectively, all showing a p-value of 0.001. This indicates highly significant relationships, leading to the rejection of the null hypothesis. Grade 7D has a moderate correlation of 0.476 with a p-value of 0.016, which is also significant, thus rejecting the null hypothesis. In contrast, Grade 7E shows a weak correlation of 0.287 and a p-value of 0.156, indicating that this relationship is not significant and the null hypothesis is not rejected.

Table 2.The Correlation Between Academic Performance and Result of GRACE-PASS in Science the Grade 7 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
7A	*0.601**	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
7B	*0.559**	*0.004*	*Highly Significant*	*Reject the Null Hypothesis*
7C	*0.613**	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
7D	*0.653***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
7E	*0.267*	*0.187*	*Not Significant*	*Do not Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 2 illustrates the correlation between academic performance and the GRACE-PASS results in Science for Grade 7 students. The Pearson's r values reveal varying strengths of correlation across different grade levels. Grades 7A, 7B, 7C, and 7D all exhibit strong positive correlations, with values of 0.601, 0.559, 0.613, and 0.653, respectively, each accompanied by a p-value of 0.001 or 0.004. These results indicate highly significant relationships, leading to the rejection of the null hypothesis and suggesting that higher academic performance is closely associated with better GRACE-PASS results. In contrast, Grade 7E shows a weaker correlation of 0.267 and a p-value of 0.187, indicating that this relationship is not significant, and thus the null hypothesis is not rejected.

Table 3. The Correlation Between Academic Performance and Result of GRACE-PASS in Mathematics in the Grade 8 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
8A	*0.441**	*0.024*	*Significant*	*Reject the Null Hypothesis*
8B	*-0.145*	*0.480*	*Not Significant*	*Do not Reject the Null Hypothesis*
8C	*0.319*	*0.105*	*Not Significant*	*Do not Reject the Null Hypothesis*
8D	*0.299*	*0.147*	*Not Significant*	*Do not Reject the Null Hypothesis*
8E	*0.425**	*0.027*	*Significant*	*Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 3 presents the correlation between academic performance and the GRACE-PASS results in Mathematics for Grade 8 students. The Pearson's r values indicate varying strengths of correlation across different grade levels. Grades 8A and 8E both show significant positive correlations, with values of 0.441 and 0.425, respectively, accompanied by p-values of 0.024 and

0.027. These results lead to the rejection of the null hypothesis, suggesting that higher academic performance is associated with better GRACE-PASS results in these grades. In contrast, grades 8B, 8C, and 8D exhibit weaker correlations, with values of 0.145, 0.319, and 0.299, and p-values of 0.480, 0.105, and 0.147, respectively.

Table 4. The Correlation Between Academic Performance and Result of GRACE-PASS in Science in the Grade 8 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
8A	*0.576***	*0.002*	*Significant*	*Reject the Null Hypothesis*
8B	*0.24*	*0.238*	*Not Significant*	*Do not Reject the Null Hypothesis*
8C	*0.591***	*0.001*	*Significant*	*Reject the Null Hypothesis*
8D	*0.322*	*0.116*	*Not Significant*	*Do not Reject the Null Hypothesis*
8E	*0.274*	*0.166*	*Not Significant*	*Do not Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 4 shows that Grade 8A and Grade 8C both exhibit significant positive correlations between academic performance and GRACE-PASS scores in Science. Specifically, Grade 8A shows a Pearson's r of 0.576 ($p = 0.002$), and Grade 8C shows a Pearson's r of 0.591 ($p = 0.001$). These correlations are strong and exceed the conventional significance level of $p < 0.05$, indicating a meaningful relationship between students' GRACE-PASS scores and their academic performance in Science. Therefore, the null hypothesis stating no correlation can be confidently rejected for both Grade 8A and Grade 8C.

But Grade 8B, Grade 8D, and Grade 8E demonstrate weaker correlations, with Pearson's r values of 0.24 ($p = 0.238$), 0.322 ($p = 0.116$), and 0.274 ($p = 0.166$), respectively. None of these correlations reach statistical significance at the $p < 0.05$ level. As a result, the null hypothesis cannot be rejected for Grade 8B, Grade 8D, and Grade 8E, indicating that any observed correlations between GRACE-PASS scores and academic performance in Science for these grade levels may be due to chance.

Table 5. The Correlation Between Academic Performance and Result of GRACE-PASS in Mathematics in the Grade 9 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
9A	*0.427**	*0.021*	*Significant*	*Reject the Null Hypothesis*
9B	*0.015*	*0.938*	*Not Significant*	*Do not Reject the Null Hypothesis*
9C	*0.490**	*0.011*	*Significant*	*Reject the Null Hypothesis*
9D	*0.220*	*0.281*	*Not Significant*	*Do not Reject the Null Hypothesis*
9E	*0.520***	*0.003*	*Significant*	*Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 5 shows that these grade levels show statistically significant positive correlations between academic performance and GRACE-PASS scores in Mathematics. Grade 9A has a Pearson's r of 0.427 ($p = 0.021$), Grade 9C has a Pearson's r of 0.490 ($p = 0.011$), and Grade 9E has a Pearson's r of 0.520 ($p = 0.003$). These correlations exceed the conventional significance level of $p < 0.05$, indicating that there is a meaningful relationship between students' GRACE-PASS scores in Mathematics and their academic performance in the subject. Therefore, the null hypothesis stating no correlation can be rejected for these grade levels.

In contrast, Grade 9B and Grade 9D exhibit weaker correlations with Pearson's r values of 0.015 ($p = 0.938$) and 0.220 ($p = 0.281$) respectively. These correlations are not statistically significant at the $p < 0.05$ level, suggesting that any observed relationships between GRACE-PASS scores and academic performance in Mathematics for these grade levels may be due to random chance.

Table 6. The Correlation Between Academic Performance and Result of GRACE-PASS in Science in the Grade 9 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
9A	*0.769****	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
9B	*0.561***	*0.002*	*Significant*	*Reject the Null Hypothesis*
9C	*0.803****	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
9D	*0.627****	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
9E	*0.521***	*0.003*	*Significant*	*Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 6 illustrates strong positive correlations between academic performance and GRACE-PASS results in Science among Grade 9 students. Grade 9A shows a particularly strong correlation (r = 0.769, p = 0.001), indicating a highly significant relationship that rejects the null hypothesis. Similarly, Grade 9B (r = 0.561, p = 0.002), Grade 9C (r = 0.803, p = 0.001), and Grade 9D (r = 0.627, p = 0.001) all demonstrate significant correlations, rejecting the null hypothesis due to their strong positive associations. Grade 9E also exhibits a notable correlation (r = 0.521, p = 0.003), which is statistically significant and contributes to rejecting the null hypothesis. These findings collectively underscore the predictive validity of GRACE-PASS assessments in Science for Grade 9 students, highlighting their relevance in assessing and guiding academic performance.

Table 7. The Correlation Between Academic Performance and Result of GRACE-PASS in Mathematics in the Grade 10 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
10A	*0.612***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
10B	*0.630***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
10C	*0.593***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
10D	*0.660***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
10E	*0.4565**	*0.011*	*Significant*	*Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 7 presents the correlation analysis between academic performance and GRACE-PASS scores in Mathematics among Grade 10 students. The results reveal strong and significant relationships across all grade levels. Grade 10A, Grade 10B, Grade 10C, and Grade 10D exhibit highly significant correlations, with Pearson's r values of 0.612 (p = 0.001), 0.630 (p = 0.001), 0.593 (p = 0.001), and 0.660 (p = 0.001) respectively, indicating strong positive associations between higher GRACE-PASS scores and better academic performance in Mathematics. Grade 10E also shows a significant correlation, with a Pearson's r of 0.4565 (p = 0.011).

Table 8. The Correlation Between Academic Performance and Result of GRACE-PASS in Science in the Grade 10 Level

Grade level	Pearson's r	p-value	Interpretation	Remarks
10A	*0.861***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
10B	*0.568***	*0.002*	*Significant*	*Reject the Null Hypothesis*
10C	*0.675***	*0.001*	*Highly Significant*	*Reject the Null Hypothesis*
10D	0.538***	*0.003*	*Significant*	*Reject the Null Hypothesis*
10E	*0.371**	*0.048*	*Significant*	*Reject the Null Hypothesis*

*Note. *p <.05, **p <.01, ***p <.001*

Table 8 presents an analysis of the correlation between academic performance and GRACE-PASS scores in Science among Grade 10 students. The results reveal compelling relationships across various sections in the grade level. Grade 10A demonstrates an exceptionally strong correlation with a Pearson's r of 0.861 (p = 0.001), indicating a strong and highly significant positive relationship between higher GRACE-PASS scores and superior academic performance in Science. Similarly, Grade 10C exhibits a substantial correlation with a Pearson's r of 0.675 (p = 0.001), reaffirming the predictive validity of GRACE-PASS assessments in Science education. Grade 10B and Grade 10D also show significant correlations, with coefficients of

0.568 (p = 0.002) and 0.538 (p = 0.003) respectively, highlighting consistent positive associations between GRACE-PASS scores and academic achievement in Science. Grade 10E displays a moderate yet significant correlation with a Pearson's r of 0.371 (p = 0.048), indicating a discernible link between GRACE-PASS scores and Science performance at this grade level. These findings collectively reject the null hypothesis for all Grade 10 levels except Grade 10E, where the correlation, while significant, is less pronounced.

IV. Conclusion

In conclusion, the analysis of the correlation between academic performance and the GRACE-PASS results across multiple grade levels reveals a consistent trend of significant positive relationships, particularly in Science and Mathematics. For Grades 7 and 8, most sections exhibited high correlations, especially in Grades 7A, 7B, 7C, and 8A, 8C, which showed highly significant results. Grade 9 further demonstrated strong correlations in Science, with all sections rejecting the null hypothesis, indicating that academic performance strongly influences assessment outcomes.

In Grade 10, the findings remain strong, with all Mathematics sections showing highly significant correlations, while Science also displayed a majority of significant results. These consistent findings across grades suggest that effective educational practices positively impact student performance,

highlighting the importance of continued support and interventions aimed at enhancing academic achievement. Overall, the results underscore the critical link between academic performance and assessment outcomes, indicating that improving academic strategies can lead to better student success in both Mathematics and Science.

Recommendations

Based on the correlation analyses between academic performance and GRACE-PASS results in Mathematics and Science across different grade levels, several recommendations can be outlined to improve educational outcomes. Schools should implement strong monitoring systems to track GRACE-PASS scores alongside academic performance, enabling early identification of students needing additional support. Tailored intervention programs should be developed based on these correlations, such as personalized tutoring or targeted remedial courses. Aligning the curriculum with GRACE-PASS skills, providing professional development for teachers, and conducting longitudinal studies are also essential. Engaging parents and students in understanding assessment goals and implementing regular formative assessments aligned with GRACE-PASS skills can further enhance learning outcomes. Future research should aim to deepen our understanding of various factors that influence Junior High School students' academic performance beyond GRACE-PASS scores. Exploring aspects such as study habits, learning styles, and the influence of teacher quality and pedagogical approaches can provide insights into how these factors interact with assessment scores to affect student outcomes. These steps collectively aim to optimize the impact of GRACE-PASS assessments on student achievement in Mathematics and Science.

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