

ANALYSIS ON GRADES AND NAT PERFORMANCE: TOWARDS A DEVELOPMENT PROGRAM IN ELEMENTARY MATHEMATICS INSTRUCTION

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ABSTRACT: *The quality of mathematics instruction in the Philippines remains a persistent concern, as reflected in the recurring gaps between pupils' classroom grades and their performance in standardized assessments such as the National Achievement Test (NAT). This study investigated the relationship between academic performance and pupils' NAT outcomes in selected public elementary schools in the Philippines. Specifically, it examined whether pupils' grades predict NAT is associated with school-level NAT results. Data were analyzed using descriptive statistics and Spearman's rho correlation. Results revealed that pupils' grades had weak predictive power for NAT performance, highlighting a gap between classroom assessment and standardized testing. The study concludes that bridging the gap between classroom learning and standardized assessments requires strengthening teacher preparedness, enhancing assessment alignment, and addressing pupil-related challenges through holistic instructional and institutional support.*

Keywords: National Achievement Test in Mathematics, Mathematics Education, Teaching Basic Mathematics.

1. INTRODUCTION

Mathematics is a foundational subject in the Philippine basic education curriculum, serving as a gateway to higher learning and essential life skills. Despite its importance, results of national and international assessments consistently show persistent gaps in student achievement. The National Achievement Test (NAT), administered annually by the Department of Education, has revealed low performance in mathematics across grade levels, reflecting both systemic and instructional challenges [1]; [2]. In particular, Grade 6 pupils often exhibit performance levels below proficiency, raising concerns about their readiness for secondary education [3].

Academic grades are frequently used by schools to monitor learner progress, yet questions remain about their predictive validity for performance in standardized assessments such as the NAT. Prior studies suggest that while classroom performance reflects continuous learning, it does not always align with outcomes in large-scale testing due to differences in assessment formats and objectives [4]. Understanding the relationship between pupils' grades and NAT results is crucial for identifying gaps in assessment practices and improving student readiness for high-stakes testing.

Given these considerations, this study aims to analyze the relationship between pupils' mathematics grades and their NAT performance in the Philippines.

Specifically, it purports to shed light to the following questions:

1. What is academic performance of grade 6 pupils in the 18 public elementary schools in Mathematics?
2. What is the National Achievement test mean percentage score (MPS) of grade 6 pupils in the 18 public elementary schools in Mathematics?
3. Is there a relationship between the academic performance and the National Achievement test mean percentage score (MPS) in Mathematics?

2. REVIEW OF RELATED LITERATURE

Academic performance, often represented by students' grades or general weighted averages, has long been considered a reliable predictor of standardized test achievement. Paredes et al. [2] revealed that mathematics grades significantly correlated with pupils' NAT outcomes, suggesting classroom

performance provides insight into national assessment readiness. Similarly, Cuajao [4] emphasized that academic performance in Filipino was associated with NAT results, though disparities in enrollment and school context complicated this relationship.

Meta-analyses reinforce this predictive link. Callaman and Itaas [5] synthesized studies from Mindanao and found that mathematical skills, attitudes, and self-efficacy significantly predicted mathematics achievement. Galangco [6] confirmed that junior high school GPA and mathematics anxiety were strong predictors of senior high mathematics achievement, aligning with international evidence. Wu et al. [7] expanded this discussion by showing that PISA mathematics results could be better explained through fine-grained knowledge attributes, confirming that prior performance lays a foundation for future outcomes.

Beyond the Philippines, Rittle-Johnson et al. [8] tracked marginalized U.S. students and found that early mathematics achievement at age four continued to predict ACT scores in 12th grade.

Factors Influencing Mathematics Achievement

Research has examined a wide range of learner, teacher, and contextual characteristics that shape mathematics outcomes. Salifu and Bakari [9] highlighted that students' perceptions and interests significantly predicted achievement, with interest showing stronger effects. Breit et al. [10] consolidated 30 meta-analyses and concluded that prior knowledge, intelligence, creativity, math-specific skills, and self-concept were among the strongest predictors, while personality traits and emotional intelligence had weaker associations.

Assessment Quality and Standardization

The accuracy and fairness of assessment instruments remain critical. Ibrahim et al. [11] developed the Standardized Mathematics Achievement Test (SMAT) with strong reliability ($KR-20 = .79$). Namoco et al. [1] found that NAT results varied significantly by subject and school size, with mathematics consistently weaker than Filipino and Araling Panlipunan. Añar et al. [3] echoed this, reporting low

proficiency in critical thinking and problem-solving across Bukidnon learners.

International and Comparative Perspectives

Large-scale assessments such as PISA provide valuable insights. Wu et al. [7] showed that cognitive diagnostic models reveal diverse learning trajectories across countries, with Singapore exhibiting the most complex patterns. Wang et al. [12] highlighted consistent predictors across ecological levels, including SES and school-level misbehavior.

3. SIGNIFICANCE OF THE STUDY

This study is significant as it highlights the relationship between pupils' classroom grades and their performance in the National Achievement Test (NAT), providing valuable insights into the alignment between school-based assessment and standardized evaluation in the Philippine basic education system. The findings reveal whether pupils' grades serve as reliable indicators of actual mastery and readiness for national assessments.

For teachers and curriculum planners, the results underscore the need to calibrate classroom assessments with the cognitive and competency requirements measured by the NAT. For school administrators, the study offers data-driven evidence to refine grading policies, strengthen monitoring of academic performance, and design interventions for improving learning outcomes. For DepEd and policymakers, it contributes empirical support for enhancing assessment frameworks to ensure that classroom performance accurately reflects national standards of proficiency.

Ultimately, this study provides a foundation for improving instructional practices and assessment design, ensuring that high classroom grades translate into authentic learning and better performance in national standardized tests.

4. METHODOLOGY

This study utilized a descriptive–correlational research design to examine the relationship between pupils' academic performance in Mathematics and their results in the 2024 National Achievement Test (NAT).

The study was conducted in 18 public elementary schools in one city in the Philippines. It consisted of 2,319 Grade 6 pupils, whose academic grades in Mathematics and NAT scores were analyzed to determine whether school-based performance can predict standardized test outcomes.

A universal sampling technique was applied to the pupils, as all available records of their Mathematics grades and NAT results were included.

Pupils' grades and NAT scores were obtained through documentary analysis, guided by a researcher-prepared checklist to ensure consistency.

For data analysis, descriptive statistics such as mean, frequency and percentage were used to describe the pupils' academic performance, NAT mean percentage scores. To test hypotheses, the Pearson product–moment correlation determined the relationship between pupils' grades and NAT scores.

Strict ethical considerations guided the study. Since the instrument had already been subjected to review and approval by the DepEd Research Ethics Committee, all procedures adhered to the highest standards of research ethics, ensuring

respect, transparency, and accountability throughout the research process.

RESULTS AND DISCUSSION

Table 1.1 Academic Performance of Grade 6 Pupils in 18 Public Elementary Schools

Schools	O 90-100	VS 85-89	S 80-84	FS 75-79	DME BELOW 75
1	21.62	32.43	24.32	18.92	2.70
2	20.29	21.74	37.68	18.84	1.45
3	13.02	13.02	20.31	52.60	1.04
4	21.95	39.02	31.71	7.32	0.00
5	12.12	13.13	32.32	39.39	3.03
6	46.88	23.44	18.75	9.38	1.56
7	19.83	40.52	33.62	6.03	0.00
8	9.62	43.27	26.92	20.19	0.00
9	29.69	26.56	29.69	14.06	0.00
10	22.22	26.39	36.81	11.81	2.78
11	22.73	22.73	25.76	28.79	0.00
12	20.92	31.63	30.10	17.35	0.00
13	35.71	45.00	17.86	1.43	0.00
14	13.41	36.31	34.08	14.53	1.68
15	21.29	48.19	25.70	4.82	0.00
16	66.67	33.33	0.00	0.00	0.00
17	64.52	35.48	0.00	0.00	0.00
18	26.72	30.57	28.74	13.97	0.00

Legend:

DESCRIPTOR	GRADING SCALE
Outstanding	90-100
Very Satisfactory	85-89
Satisfactory	80-84
Fairly Satisfactory	75-79
Did Not Meet Expectations	Below 75

*Department of Education

The academic performance of Grade 6 pupils across the 18 public elementary schools presents a mixed profile, reflecting both strengths and persistent challenges in mathematics achievement. Schools 16 and 17 demonstrated the highest proportion of pupils performing at the Outstanding and Very Satisfactory levels (100% combined), suggesting strong instructional practices and effective academic support. In contrast, Schools 3 and 5 recorded alarming concentrations of pupils in the Fairly Satisfactory and Did Not Meet Expectations levels, with over half of the learners in School 3 (52.6%) and nearly 42% in School 5 struggling to meet the expected standards.

The overall distribution highlights that while a considerable proportion of pupils are performing satisfactorily and above, a significant percentage remain clustered in the lower bands. This echoes findings in Philippine contexts where disparities

in achievement across schools often correlate with resource availability, instructional quality, and learner readiness [1; 3].

Table 2.1 National Achievement Test Performance of Grade 6 Pupils in 18 Public Elementary Schools

School	HP	P	NP	LP	NP
1	0.00	12.50	12.50	50.00	25.00
2	0.00	11.11	0.00	66.67	22.22
3	0.00	2.78	16.67	50.00	30.56
4	0.00	0.00	25.00	50.00	25.00
5	0.00	0.00	6.25	62.50	31.25
6	0.00	0.00	25.00	50.00	25.00
7	0.00	0.00	4.17	70.83	25.00
8	0.00	0.00	22.22	50.00	27.78
9	0.00	0.00	33.33	58.33	8.33
10	0.00	0.00	30.00	65.00	5.00
11	0.00	0.00	0.00	60.00	40.00
12	0.00	6.67	20.00	70.00	3.33
13	0.00	0.00	18.18	54.55	27.27
14	0.00	0.00	25.00	50.00	25.00
15	0.00	2.50	15.00	50.00	32.50
16	0.00	37.50	37.50	25.00	0.00
17	12.50	62.50	25.00	0.00	0.00
18	0.00	2.41	33.73	50.60	13.25

Legend:

Levels of Proficiency	MPS	Descriptions
Highly Proficient	90-100	At this level, the students are highly capable of solving problems, managing and communicating accurate information, and analyzing and evaluating data to create/formulate ideas.
Proficient	75-89	At this level, students are skilled in solving problems, managing and communicating information, and analyzing and evaluating data to create/formulate ideas.
Nearly Proficient	50 - 74	At this level, students met the minimum level of skills in solving problems, managing and communicating information, and analyzing and evaluating data to comprehend ideas.
Low Proficient	25-49	At this level, students can identify strategies in solving problems, differentiate and organize information.
Not Proficient	0-24	At this level, students can solve simple problems, classify and identify the source of information.

Table 2.1 presents the distribution of Grade 6 pupils' performance in the National Achievement Test (NAT) across 18 public elementary schools. The data reveal that the majority of schools recorded pupils within the Low Proficient and Not Proficient categories, indicating that most learners did not reach the expected mastery level in Mathematics. Specifically, over half of the schools reported 50% or more of their pupils as Low Proficient, while several schools (e.g., Schools 3, 5, 7, 11, and 15) had at least one-fourth of their pupils classified as Not Proficient.

Notably, no school attained a majority of Highly Proficient pupils, and only one institution (School 17) achieved a significant proportion of Proficient learners at 62.50% and Highly Proficient at 12.50%. Meanwhile, a few schools (Schools 9, 10, and 16) showed moderate distributions under the Nearly Proficient category, reflecting some improvement toward mastery but still below national competency expectations.

The overall pattern suggests a pervasive challenge in achieving proficiency in Mathematics at the elementary level. The predominance of Low Proficient and Not Proficient ratings implies gaps in foundational mathematical understanding, assessment alignment, and instruction. These findings align with national trends reported in earlier studies

[3; 13], which emphasize declining NAT performance and the need for targeted interventions to enhance numeracy skills and problem-solving abilities among Filipino learners.

Table 3.1 Relationship Between the Academic Performance and the National Achievement Test Mean Percentage Score (MPS) in Mathematics

Academic Performance	Spearman	p-value	Interpretation
National Achievement Test	-0.203	0.420	Weak and Negative, Not Significant

The analysis of the relationship between pupils' academic performance and their National Achievement Test (NAT) mean percentage score (MPS) in Mathematics reveals a Spearman correlation coefficient of -0.203 with a p-value of 0.420 . According to the interpretation scale of Calmorin, this indicates a weak and negative correlation that is not statistically significant. In other words, higher grades in classroom-based assessments do not consistently align with higher NAT performance among the participating schools.

This finding underscores the persistent mismatch between school-based academic performance and standardized test outcomes. Several studies have highlighted that while classroom grades often reflect continuous and varied forms of assessment, they may not accurately predict outcomes in standardized tests such as the NAT [2; 4]. Similar evidence in international contexts shows that school assessments sometimes inflate learners' proficiency compared to standardized benchmarks [12; 7].

The negative but weak association suggests that some pupils who perform well in school may not necessarily achieve proficiency in the NAT, pointing to differences in assessment orientation and emphasis.

CONCLUSION

The findings of the study revealed that there was a weak and negative relationship between pupils' academic grades and their National Achievement Test (NAT) mean percentage scores, indicating that high classroom performance did not necessarily correspond to strong results in standardized assessments. This suggests a clear misalignment between school-based evaluations and the competencies measured in the NAT. While pupils generally attained satisfactory to very good ratings in their classroom grades, the NAT results showed that the majority performed within the Low Proficient and Not Proficient levels, reflecting inconsistency in mastery. Such disparity implies that classroom assessments may emphasize recall and procedural tasks rather than the higher-order thinking and problem-solving skills emphasized in the NAT. The results also highlight that existing evaluation practices might overestimate pupil achievement, as they are not fully aligned with national standards or cognitive expectations.

RECOMMENDATIONS

The findings of this study highlight the need for a more coherent alignment between classroom assessments and the competencies measured by the National Achievement Test (NAT). Classroom tests should be reviewed and redesigned to mirror the cognitive demands and higher-order thinking skills assessed in the NAT. Strengthening this alignment will

ensure that school-based evaluations more accurately reflect pupils' true level of proficiency and preparedness for standardized testing.

Moreover, the implementation of targeted intervention programs is essential to address pupils' persistent learning gaps. Remediation and enrichment activities focusing on the four fundamental operations, problem-solving, and comprehension of mathematical concepts should be prioritized. These efforts will enhance both procedural fluency and conceptual understanding, allowing pupils to perform more competently in standardized assessments. Equally important is the provision of adequate instructional materials and the adoption of innovative, contextualized teaching approaches to make mathematics more engaging and meaningful. The use of real-life problem contexts, manipulatives, and digital learning tools can foster active participation and improve understanding among learners with diverse needs.

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