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Understanding the Grade One Learners' Perceived Numeracy Skills and Their Rapid Math Assessment Performance

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ABSTRACT

This study aimed to determine the relationship between Grade One learners' perceived numeracy skills and Rapid Mathematics Assessment (RMA) performance as a basis for developing a Numeracy Skills Enhancement Plan. It employed a quantitative descriptive-correlational research design at Carcar Central Elementary School, Carcar City, Cebu, during the school year 2026–2027. A total of 277 Grade One learners participated through total enumeration sampling. Data were gathered using a Survey Questionnaire for Parents, a Perceived Numeracy Skills Assessment, and the Rapid Mathematics Assessment (RMA) Toolkit for Grade One. Frequency counts, percentages, weighted means, arithmetic means, standard deviations, and Pearson's product-moment correlation coefficient were utilized in analyzing the data. Findings revealed that most learners were six to seven years old, predominantly from families with modest monthly incomes. Their perceived numeracy skills in Measurement and Geometry and Number and Algebra were Very Satisfactory, while their overall RMA performance was Satisfactory. A statistically significant but weak positive relationship was established between perceived numeracy skills and RMA performance. The study concluded that favorable numeracy skill ratings did not necessarily correspond to equally high assessment performance, highlighting the need for complementary assessments and targeted instruction. It was recommended that the proposed Numeracy Skills Enhancement Plan be implemented to reinforce numerical comparison, addition representation, and measurement-related problem-solving through differentiated activities and continuous progress monitoring.

KEYWORDS

Foundational numeracy, Rapid Mathematics Assessment, perceived numeracy skills, Measurement and Geometry.

ARTICLE INFORMATION

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1. Introduction

Foundational numeracy represented an essential component of children's early learning because it supported mathematical reasoning, problem-solving, and subsequent academic achievement. Ruiz et al. (2024) emphasized that competencies developed at the beginning of formal schooling contributed to later mathematics outcomes, while Outhwaite et al. (2024) highlighted the value of assessing early mathematical skills to identify learners requiring assistance. For Grade One learners, counting, number comparison, operations, measurement, and geometry provided the foundation for increasingly complex mathematical experiences. Investigating these competencies therefore offered an important opportunity to strengthen instructional decisions and prevent persistent learning gaps.

Globally, inadequate mathematics proficiency remained a major educational challenge. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2024) estimated that only 44% of learners attained minimum mathematics proficiency by the end of primary education, leaving approximately 56% below this benchmark. This statistic indicated that school participation alone did not guarantee mastery of essential mathematical concepts. Such difficulties potentially limited learners' progression toward more advanced reasoning and problem-solving. International evidence consequently underscored the importance of developmentally appropriate mathematics instruction, early assessment, and timely intervention during the primary grades.

In the Philippines, the Programme for International Student Assessment (PISA) 2022 reported an average mathematics score of 355, compared with the Organisation for Economic Co-operation and Development (OECD) average of 472. Only 16% of Filipino 15-year-olds attained at least Level 2 proficiency, against the OECD average of 69% (OECD, 2023). Although PISA did not assess Grade One children, these outcomes demonstrated the country's wider mathematics learning challenges. Additionally, UNICEF

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Philippines (2025) reported that the proportion of Grade Five learners reaching higher mathematics proficiency bands increased from 17% in 2019 to 26% in 2024. Despite progress, disparities across socioeconomic groups and regions remained evident, strengthening the case for early numeracy support. The Department of Education (2024) responded to foundational learning concerns through the MATATAG Curriculum, which prioritized essential competencies and developmentally responsive instruction. These priorities aligned with Sustainable Development Goal 4, particularly Target 4.1 on quality primary education and Target 4.2 on early childhood development and pre-primary education. UNESCO, UNICEF, and the Early Childhood Care and Development Council likewise promoted equitable learning opportunities, school readiness, and appropriate developmental assessment. Their efforts reinforced the significance of strengthening mathematical understanding during the transition from Kindergarten to Grade One, when children encountered more systematic expectations for numerical reasoning and mathematical communication.

At the local level, findings from Carcar Central Elementary School in Carcar City, Cebu, confirmed that varying numeracy performance existed among the 277 Grade One learners studied. The Rapid Mathematics Assessment (RMA) results showed that 104 learners (37.55%) obtained Satisfactory ratings, 77 (27.80%) attained Very Satisfactory ratings, and 36 (13.00%) achieved Outstanding ratings. However, 51 learners (18.41%) were rated Fairly Satisfactory, while nine (3.25%) did not meet expectations. Their mean score was 20.03 out of 35, with a standard deviation of 7.08. Thus, 60 learners (21.66%) performed below the Satisfactory category, indicating a concrete need for additional support within the research environment.

Further local evidence revealed specific learning areas requiring reinforcement. Learners obtained Very Satisfactory aggregate ratings in Measurement and Geometry (3.70) and Number and Algebra (3.68). Nevertheless, solving measurement problems and comparing numbers each received a relatively lower weighted mean of 3.53, while illustrating addition using concrete or pictorial models obtained 3.54. These patterns suggested that learners could demonstrate generally positive classroom numeracy ratings while still experiencing difficulties with particular tasks. They described plausible classroom scenarios involving challenges in comparing quantities, representing addition, and applying measurement knowledge, although individual incidents were not documented by the summarized tables.

Family circumstances also supplied important educational context. Of the respondents, 94 (33.94%) came from households earning ₱10,000 or less monthly, while 196 (70.76%) reported incomes of ₱20,000 or less. Such differences may have shaped access to supplementary materials and home learning opportunities, but the descriptive data did not establish socioeconomic causes of mathematical performance. Equitable access to manipulatives, contextualized exercises, and guided learning activities consequently remained important considerations for teachers.

A research gap persisted regarding how Grade One learners' assessed numeracy skills corresponded with their performance on the RMA in a specific Philippine public school. Although Ruiz et al. (2024) and Outhwaite et al. (2024) investigated foundational mathematics and assessment, their work did not establish this local association. Findings of this study revealed a statistically significant yet weak positive relationship between numeracy ratings and RMA scores ($r = .302$, $p < .001$). This result supported examining complementary assessments rather than assuming that positive skill ratings necessarily reflected equally strong standardized performance.

Accordingly, the study aimed to determine the relationship between perceived numeracy skills and RMA performance among Grade One learners at Carcar Central Elementary School during the school year 2026–2027 as a basis for a Numeracy Skills Enhancement Plan. Specifically, it described learners' demographic and socioeconomic profiles, determined their RMA performance, assessed their skills in Measurement and Geometry and Number and Algebra, and tested the relationship between the two measures. The findings provided localized evidence for differentiated instruction, targeted intervention, and more responsive early mathematics assessment. These measures were intended to support inclusive and sustained mathematical learning.

2. Literature Review

Numeracy is a fundamental component of mathematical learning because it enables learners to interpret quantities, recognize numerical relationships, solve problems, and apply mathematical ideas in everyday and academic situations (Rahmah & Zulfadewina, 2025). International assessments consistently show that mathematical performance depends not only on procedural calculation but also on learners' ability to reason, represent relationships, and use mathematics in unfamiliar contexts. The OECD (2023) emphasized through PISA 2022 that mathematical literacy involves formulating, employing, and interpreting mathematics across real-life situations, while the International Association for the Evaluation of Educational Achievement reported through TIMSS that achievement in mathematics is strongly connected with competencies in number, algebra, geometry, measurement, and data (Mullis et al., 2020). More recent TIMSS findings similarly underscore the importance of foundational mathematical knowledge for later achievement (Mullis et al., 2024). The World Bank et al. (2022) also identified persistent learning losses and weaknesses in foundational skills following disruptions in schooling, reinforcing the need for diagnostic assessment of basic competencies. UNESCO (2023) further emphasized that assessment should support equitable learning by identifying where learners require additional instructional support. In mathematics education, structured diagnostic assessment can therefore provide teachers with evidence about learners' actual performance rather than relying solely on general classroom impressions. Guidance from the Education Endowment Foundation (2021) likewise recommends using assessment information to identify misconceptions and adapt mathematics instruction, while the National Council of Teachers of Mathematics (2020) stresses

meaningful reasoning, conceptual understanding, and coherent mathematical experiences. These perspectives support the use of the Rapid Mathematics Assessment as a means of determining learners' demonstrated mathematical performance.

Perceived numeracy skills are also important because learners' judgments about their own mathematical ability may influence persistence, participation, confidence, and willingness to engage with challenging tasks (Peters & Shoots-Reinhard, 2022). Mathematics learning involves interconnected content areas, particularly number and algebra and measurement and geometry. Number and algebra require understanding numerical magnitude, operations, patterns, equivalence, and relationships, while measurement and geometry involve spatial reasoning, properties of shapes, units, comparison, and quantitative relationships. Clements and Sarama (2021) emphasized that mathematical competence develops through connected learning trajectories that build number, spatial, measurement, and reasoning skills progressively. Boaler (2022) similarly argued that learners benefit when mathematics is understood conceptually rather than as isolated procedures. Evidence from international assessment research also shows that learners' confidence, attitudes, and beliefs about mathematics are associated with how they approach mathematical tasks, although perceived competence does not always correspond exactly with demonstrated achievement (OECD, 2023). The National Academies of Sciences, Engineering, and Medicine (2021) further emphasized the importance of equitable opportunities and supportive learning environments in strengthening participation in STEM-related learning. UNICEF (2022) likewise highlighted the importance of foundational numeracy for continued educational participation and later learning. Assessment frameworks developed for large-scale studies indicate that mathematical achievement should therefore be examined across specific content domains rather than treated as a single undifferentiated skill (Mullis et al., 2020). Consequently, examining learners' perceived numeracy skills in measurement and geometry and number and algebra alongside their RMA performance can reveal whether learners' self-perceptions correspond with their demonstrated competencies and can help identify areas requiring targeted mathematics intervention.

3. Methodology

This study employed a quantitative descriptive-correlational research design to determine the relationship between the perceived numeracy skills and Rapid Mathematics Assessment (RMA) performance of Grade One learners at Carcar Central Elementary School during the school year 2026–2027. The descriptive component was used to present the learners' demographic and socioeconomic profiles, determine their RMA performance, and assess their perceived numeracy skills in Measurement and Geometry and Number and Algebra. The correlational component examined the strength, direction, and significance of the relationship between perceived numeracy skills and RMA performance using Pearson's product-moment correlation coefficient at the 0.05 level of significance. The respondents consisted of 277 Grade One learners selected through total enumeration. Eight Grade One teachers also participated as secondary respondents by providing assessments of learners' perceived numeracy skills based on classroom observations. Different instruments were utilized: a 17-item Perceived Numeracy Skills Assessment and the 35-item Rapid Mathematics Assessment Toolkit for Grade One developed by the Department of Education. The perceived numeracy assessment covered Measurement and Geometry and Number and Algebra, while the RMA measured number identification, fractions, basic operations, geometry, patterns, time measurement, and linear measurement. Before data gathering, the researcher secured institutional approvals, informed consent from parents or guardians, and learner assent. The instruments were administered following ethical and data-privacy requirements. Completed responses were checked, coded, organized, and analyzed with statistical assistance. Frequency counts and percentages were used to describe learner profiles and RMA performance categories, while weighted means and standard deviations were used to determine perceived numeracy skill levels. The arithmetic mean and standard deviation summarized overall RMA performance. Pearson's correlation coefficient determined the relationship between the two principal variables. The findings served as the basis for developing a Numeracy Skills Enhancement Plan responsive to identified learner needs.

4. Results

Table 1. Level of the performance of the learners in Rapid Mathematics Assessment

Level	Numerical Range	f	%
Outstanding	29-35	36	13.00
Very Satisfactory	22-28	77	27.80
Satisfactory	15-21	104	37.55
Fairly Satisfactory	8-14	51	18.41

Did not Meet the Expectations	0-7	9	3.25
Total		277	100.00
Mean		20.03	
St. Dev.		7.08	

The findings show that the learners' overall performance in the Rapid Mathematics Assessment was Satisfactory, with a mean score of 20.03 and a standard deviation of 7.08. The largest group of learners, representing 37.55%, were classified as Satisfactory, while 27.80% were Very Satisfactory and 13.00% were Outstanding. However, 18.41% were Fairly Satisfactory and 3.25% did not meet expectations. This implies that although most Grade One learners demonstrated acceptable foundational numeracy skills, a notable proportion still requires additional instructional support. Targeted remediation, differentiated activities, and focused practice in weak numeracy areas may help improve overall mathematics performance.

Table 2. Level of numeracy skills of the learners in terms of measurement and geometry

S/N	Indicators	WM	SD	Verbal Description
1	Identify simple 2-dimensional shapes of different size and in different orientation.	3.75	1.16	Very Satisfactory
2	Compare and distinguish 2-dimensional shapes according to features such as sides and corners.	3.58	1.10	Very Satisfactory
3	Compose and decompose triangles, squares, and rectangles.	3.58	1.02	Very Satisfactory
4	Measure the length of an object and the distance between two objects using non-standard units.	3.89	0.95	Very Satisfactory
5	Compare lengths and distances using non-standard units.	3.84	1.00	Very Satisfactory
6	Solve problems involving lengths and distances using non-standard units.	3.53	0.92	Very Satisfactory
	Aggregate Mean	3.70		Very Satisfactory
	Aggregate Standard Deviation		1.02	

Table 2 shows that the learners' numeracy skills in Measurement and Geometry were rated Very Satisfactory, with an aggregate mean of 3.70 and an aggregate standard deviation of 1.02. Measuring length and distance using non-standard units obtained the highest mean of 3.89, followed by comparing lengths and distances at 3.84. Solving problems involving lengths and distances received the lowest mean of 3.53. This implies that learners generally demonstrate strong foundational skills in measurement and geometry, although problem-solving involving measurement concepts requires additional reinforcement through concrete, visual, and contextualized learning activities.

Table 3. Level of numeracy skills of the learners in terms of number and Algebra

S/N	Indicators	WM	SD	Verbal Description
1	Count up to 100 (includes counting up or down from a given number and identifying a number that is 1 more or 1 less than a given number).	3.83	1.07	Very Satisfactory
2	Read and write numerals up to 100.	3.55	1.10	Very Satisfactory
3	Recognize and represent numbers up to 100 using a variety of concrete and pictorial models (e.g., number line, block or bar models, and numerals).	3.83	1.00	Very Satisfactory
4	Compare two numbers up to 20.	3.53	0.94	Very Satisfactory
5	Order numbers up to 20 from smallest to largest, and vice versa.	3.65	0.96	Very Satisfactory
6	Describe the position of objects using ordinal numbers: 1st, 2nd, 3rd, up to 10th.	3.85	1.06	Very Satisfactory
7	Compose and decompose numbers up to 10 using concrete materials (e.g., 5 is 5 and 0; 4 and 1; 3 and 2; 2 and 3; 1 and 4; 0 and 5).	3.56	1.03	Very Satisfactory
8	Illustrate addition of numbers with sums up to 20 using a variety of concrete and pictorial models and describes addition as "counting up," and "putting together."	3.54	0.94	Very Satisfactory
9	Illustrate by applying the following properties of addition, using sums up to 20, the sum of zero and any number is equal to the number	3.76	1.04	Very Satisfactory
10	Illustrate by applying the following properties of addition, using sums up to 20, changing the order of the addends does not change the sum.	3.73	1.08	Very Satisfactory
11	Solve problems (given orally or in pictures) involving addition with sums up to 20.	3.70	1.00	Very Satisfactory
	Aggregate Mean	3.68		Very Satisfactory
	Aggregate Standard Deviation		1.02	

The data show that learners' numeracy skills in Number and Algebra were rated Very Satisfactory, with an aggregate mean of 3.68 and an aggregate standard deviation of 1.02. Describing the position of objects using ordinal numbers obtained the highest mean of 3.85, followed by counting up to 100 and recognizing numbers using concrete and pictorial models, both at 3.83. Comparing

two numbers up to 20 received the lowest mean of 3.53. This implies that learners generally demonstrate strong foundational number and algebra skills, although numerical comparison and basic addition concepts may still require further reinforcement through guided and concrete learning activities.

Table 4. Summary on the level of numeracy skills of the learners

Components	WM	SD	Verbal Description
Measurement and Geometry	3.70	1.02	Very Satisfactory
Number and Algebra	3.68	1.02	Very Satisfactory
Grand Mean	3.69		Very Satisfactory
Grand Standard Deviation		1.02	

Table 4 shows that the learners' overall numeracy skills were rated Very Satisfactory, with a grand mean of 3.69 and a grand standard deviation of 1.02. Measurement and Geometry obtained a slightly higher weighted mean of 3.70 than Number and Algebra at 3.68, although both components received the same verbal description. This indicates that the learners generally demonstrated a high level of numeracy proficiency across the two mathematical domains. The result implies that existing instructional practices are generally effective, but continued reinforcement through differentiated, concrete, and contextualized activities is necessary to sustain and further improve learners' foundational mathematics skills.

Table 5. Test of Significance of the Relationship Between the Performance of the Learners in RMA and the Numeracy Skills of the Learners

Variables	r-value	Strength of Correlation	p-value	Decision	Result
RMA Performance and Numeracy Skills	0.302*	Weak Positive	< .001	Reject H_0	Significant

Significant at $p<0.05$ (two-tailed)

The findings show a statistically significant relationship between the learners' Rapid Mathematics Assessment performance and their numeracy skills. The computed r-value of 0.302 indicates a weak positive correlation, while the p-value of less than .001 is lower than the 0.05 level of significance. Therefore, the null hypothesis was rejected. This means that learners who demonstrated higher perceived numeracy skills tended to achieve better RMA performance, although the strength of the association was relatively weak. The result suggests that perceived competence in Measurement and Geometry and Number and Algebra is related to actual mathematics performance, but other factors may also influence RMA outcomes. The implication is that teachers should not rely solely on learners' perceived numeracy skills when identifying mathematical proficiency. Regular diagnostic assessment, targeted remediation, differentiated instruction, and continuous monitoring should be used alongside perception-based measures to better identify learning gaps and strengthen foundational numeracy performance among Grade One learners.

5. Discussion

The findings indicate that the Grade One learners generally demonstrated acceptable to strong foundational numeracy performance. Their assessment results suggest that many learners were able to perform expected mathematical tasks, particularly those involving basic measurement, geometry, number concepts, and algebraic thinking. However, the distribution of performance also shows that some learners still experienced difficulty in foundational competencies and would benefit from additional instructional support. The pattern of results suggests that learners were relatively more capable in identifying and applying basic mathematical concepts than in tasks that required deeper comparison, problem solving, or transfer of knowledge to less familiar situations. This indicates the need for sustained instruction using concrete materials, visual representations, guided practice, and contextualized activities to strengthen both conceptual understanding and mathematical reasoning.

The significant positive relationship between RMA performance and perceived numeracy skills further suggests that learners who were assessed as having stronger numeracy competencies also tended to perform better in the formal mathematics assessment. However, the relationship was weak, indicating that perceived numeracy skills alone do not fully explain actual assessment

performance. Other factors such as learning readiness, instructional exposure, classroom participation, home support, and familiarity with assessment tasks may also contribute to achievement. This implies that teachers should combine classroom-based observations with objective diagnostic assessment when identifying learners' strengths and difficulties. The findings support the use of differentiated instruction, targeted remediation, continuous progress monitoring, and focused numeracy activities to address learning gaps and improve the mathematical performance of Grade One learners.

6. Conclusion

The study concludes that Grade One learners generally demonstrated satisfactory RMA performance and very satisfactory numeracy skills in Measurement and Geometry and Number and Algebra. A significant but weak positive relationship was found between RMA performance and numeracy skills, indicating that stronger numeracy competencies were associated with better mathematics performance. However, other factors may also influence achievement. Therefore, continuous assessment, differentiated instruction, targeted remediation, and contextualized numeracy activities are necessary to strengthen learners' foundational mathematical skills and improve overall performance.

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