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Numeracy Skills of Grade Six Learners Across Mathematical Domains

Rosalie F . Fajardo [1]
0009-0001-3096-7998

Jose Donnie S. Sajonia [1]
0009-0004-5442-0729

1 – STI West Negros University

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Abstract

This study determined the numeracy skills of Grade Six learners across mathematical domains as basis for an intervention plan during the School Year 2026–2027. Specifically, it assessed learners' numeracy skills in number and algebra, geometry and measurement, and data and probability and examined differences when grouped according to sex, number of siblings, and parents' educational attainment. The study employed a descriptive research design involving 66 Grade Six learners in one school in a highly urbanized city in the Negros Island Region. Data were gathered using a researcher-constructed 30-item numeracy test that underwent expert validation and reliability testing. Frequency, percentage, mean, and independent-samples t-test were used to analyze the data. Findings revealed that the learners were Nearly Proficient in all three mathematical domains, with Data and Probability obtaining the highest performance and Geometry and Measurement the lowest. Descriptive variations in numeracy skills were observed across the respondents' profile variables; however, no significant differences were found in any of the three domains when learners were grouped according to sex, number of siblings, and parents' educational attainment. The findings indicate common numeracy competency gaps among Grade Six learners, highlighting the need to further strengthen their competencies in Number and Algebra, Geometry and Measurement, and Data and Probability through appropriate interventions.

Keywords: *Grade Six learners, mathematical domains, numeracy skills, numeracy intervention, proficiency*

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Introduction:

Nature of the Problem

Numeracy skills are vital competencies that enable learners to identify and apply mathematical concepts in school and real-life situations. These skills include number and algebra, geometry and measurement, and data and probability. Grade Six learners are expected to develop strong foundational numeracy skills as part of the K to 12 Mathematics Curriculum of the Department of Education (DepEd, 2016). However, many learners still encounter difficulties in mastering these competencies, which affects their overall performance in mathematics.

In the school setting, teachers often observe that learners struggle with solving word problems, performing basic operations, interpreting graphs, and understanding measurement concepts. These difficulties are reflected in school assessments such as the Rapid Mathematics Assessment (RMA), where 106 out of 211, or 50.2 percent, of Key Stage 2 learners assessed fall under the Not Proficient and Low Proficient levels in numeracy skills. These findings indicate gaps in learners' numeracy development that need to be addressed at the elementary level, particularly in Grade Six, and highlight the need for targeted interventions to strengthen mathematical understanding.

This concern is also aligned with the United Nations Sustainable Development Goal (SDG) 4: Quality Education, which seeks to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. In particular, SDG Target 4.1 emphasizes that all children should complete quality primary and secondary education leading to relevant and effective learning outcomes. Moreover, SDG Indicator 4.1.1 specifically considers the proportion of children and young people achieving at least a minimum proficiency level in reading and mathematics at different stages of basic education. Thus, addressing the numeracy difficulties of Grade Six learners contributes to the broader global commitment to improving learning outcomes and ensuring that learners acquire the mathematical competencies necessary for further education and meaningful participation in society.

At the classroom level, learners' numeracy performance may be influenced by different factors such as sex, parents' educational attainment, and number of siblings. Bernardo (2019) stressed that learners' mathematics difficulties are often connected to weak conceptual understanding and limited learning support at home and school. Orbeta and Paqueo (2021) also perceived that socioeconomic and educational background factors can affect learners' academic achievement, including mathematics performance. However, there is still a need to specifically examine how these variables relate to learners' numeracy skills across different content domains.

Grade Six represents a critical stage in numeracy development, as learners transition from basic arithmetic to more complex mathematical domains such as algebra, geometry, measurement, data, and probability. Difficulties at this stage may hinder their readiness for secondary education and

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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

potentially limit future opportunities in science, technology, engineering, and mathematics (STEM)-related fields. Research suggests that evaluating learners' numeracy skills across demographic variables provides significant insights into patterns of achievement and areas of difficulty (Adam, 2020). Such analysis can guide educators in developing evidence-based interventions responsive to learners' specific needs.

Considering these concerns, the researcher is motivated to investigate and analyze the numeracy skills of Grade Six learners in her school, focusing on their performance in number and algebra, geometry and measurement, and data and probability. By examining differences in numeracy skills according to selected demographic variables and identifying areas requiring improvement, the study seeks to provide a basis for an intervention plan that strengthens numeracy instruction. In doing so, the study supports not only the goals of the K to 12 Mathematics Curriculum but also the attainment of SDG 4, particularly the promotion of effective learning outcomes and minimum proficiency in mathematics among school-age learners.

Current State of Knowledge

Recent research indicates that numeracy remains an important area of concern among Filipino elementary learners. Francisco et al. (2025) examined the numeracy skills and mathematics academic performance of Grade VI learners at Barotac Nuevo Central Elementary School. Using a standardized 60-item assessment among 69 randomly selected learners, the study provided empirical evidence on learners' numeracy competencies and their association with mathematics performance. The study underscores the importance of assessing specific numeracy competencies rather than relying solely on classroom grades to determine learners' mathematical abilities. Consequently, systematic assessment of Grade Six learners can help identify particular competencies that require instructional support and serve as a basis for developing appropriate interventions.

Moreover, recent evidence suggests that learners' numeracy performance may vary according to their demographic and family backgrounds. Serato, Binaloga, and Bautista (2025) assessed the numeracy skills of elementary learners in the Alternative Learning System in Southern Negros and found generally high proficiency in basic arithmetic operations, fractions, decimals, percentages, and problem-solving. However, significant differences were identified in some numeracy areas when learners were grouped according to parents' highest educational attainment, number of siblings, and average monthly family income. Thus, the findings suggest that numeracy development should not be viewed solely as a classroom concern because learners' family and socioeconomic circumstances may also be associated with differences in mathematical performance. This supports examining demographic variables such as sex, parents' educational attainment, and number of siblings in studies of Grade Six numeracy.

Similarly, national and regional evidence shows that although improvements in mathematics proficiency have occurred, substantial learning gaps remain. The SEA-PLM 2024 assessment

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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

included 5,070 Grade 5 learners in the Philippines and showed an increase in the proportion reaching higher mathematics proficiency levels, from 17 out of 100 learners in 2019 to 26 out of 100 in 2024. Nevertheless, the regional report indicates that the Philippines' average mathematics performance improved while the proportion of learners at lower performance levels changed very little. Therefore, the persistence of learners with weak mathematical competencies despite improvements among higher-performing learners demonstrates the continuing need for school-level assessment and targeted numeracy support, particularly as learners approach the transition to secondary education.

Furthermore, intervention-based research demonstrates that identified numeracy deficiencies can be addressed through structured remedial instruction. Abiera, Cada, and Lalosa (2025) investigated the effectiveness of remedial classes among 80 Grade Six non-numerates in the Eastern Samar Division using a quasi-experimental design. The learners were initially identified as non-proficient or low proficient based on their numeracy assessment results. After the intervention, the experimental group attained a proficient post-test level, while the control group remained nearly proficient, with a significant difference between the groups' post-test results. Hence, the findings provide evidence that targeted remedial activities based on diagnosed numeracy difficulties can contribute to improved mathematical competencies among Grade Six learners.

Furthermore, intervention-based research demonstrates that identified numeracy deficiencies can be addressed through structured and targeted instructional approaches. Abiera, Cada, and Lalosa (2025) investigated the effectiveness of remedial classes among Grade Six non-numerates and found improvements in learners' numeracy performance following the intervention. Consistent with this finding, Rubica and Guanzon (2025) examined the effects of Project IDEAL on the arithmetic performance of Key Stage 2 learners in a public elementary school in Western Visayas. Their findings revealed substantial increases in arithmetic performance after instruction in both the traditional and technology-assisted groups, although the experimental group exposed to tablets with mathematics applications demonstrated a greater effect. Taken together, these findings suggest that learners experiencing numeracy difficulties can benefit from appropriately designed and responsive instructional interventions. They further support the present study's intention to assess Grade Six learners' numeracy skills as an empirical basis for developing an intervention plan responsive to their identified areas of difficulty.

Finally, the importance of strengthening numeracy competencies before learners transition to secondary education is supported by Para and Guanzon (2026), who examined the mathematics difficulties experienced by Grade 7 learners as a basis for an instructional intervention plan. Their findings revealed difficulties associated with cognitive, affective, motivational, learning-environment, and support-related factors, with certain learner characteristics contributing to differences in the difficulties experienced. In this regard, identifying and addressing mathematical difficulties while learners are still in Grade Six may help strengthen the

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

foundational competencies needed as they enter secondary education. This reinforces the importance of assessing Grade Six learners' numeracy skills across the domains of number and algebra, geometry and measurement, and data and probability and subsequently developing interventions responsive to the identified learning gaps.

Theoretical Underpinnings

The present study is anchored on Constructivist Theory, largely associated with Jean Piaget, which holds that learners actively construct knowledge by connecting new experiences with their existing cognitive structures. In mathematics, learning occurs when learners engage with mathematical concepts, solve problems, recognize relationships, and relate new ideas to their prior knowledge. Bermejo et al. (2021) emphasized that constructivist mathematics instruction promotes active learning and conceptual understanding, allowing learners to develop mathematical competence progressively.

Moreover, Constructivist Theory is relevant to numeracy because mathematical competencies build upon previously acquired knowledge and skills. Learners' understanding of more complex concepts depends on the strength of their foundational mathematical knowledge. In the context of the present study, the theory supports the assessment of Grade Six learners' numeracy skills in number and algebra, geometry and measurement, and data and probability. Identified weaknesses in these domains may indicate areas where learners need additional opportunities and appropriate learning experiences to strengthen their mathematical understanding.

Therefore, Constructivist Theory also provides a foundation for developing the proposed intervention plan. Bermejo et al. (2021) found that constructivist-based mathematical interventions can improve learners' mathematical competence and problem-solving performance. Accordingly, the present study assumes that identifying learners' existing numeracy skills and specific areas of difficulty can guide the development of targeted, contextualized, and learner-centered interventions that build on prior knowledge and strengthen mathematical competencies.

Objectives of the Study

This study aimed to determine the levels of the numeracy skills of Grade Six learners in one of the schools in a highly urbanized city in Negros Island Region as basis for an intervention plan during the School Year 2026-2027. Specifically, this study sought answers to the following questions: What is the profile of the respondents in terms of sex, parents' educational attainment, and number of siblings? What is the level of numeracy skills of Grade Six learners in terms of the content domain as number and algebra, geometry and measurement, and data and probability? What is the level of numeracy skills of Grade Six learners when grouped according to the aforementioned variables? And, is there a significant difference in the levels of numeracy skills of Grade Six learners when grouped and compared according to the aforementioned variables?

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Research Methodology:

This section presents the research design, data-gathering procedure, other instrumentation, and statistical tools. It also discusses the parameters, especially the statistical tools, the respondents, and the study's locality.

Research Design

Descriptive research design is an approach used to systematically describe a population, condition, or phenomenon as it naturally exists without manipulating the variables under investigation. It provides information about the characteristics and existing conditions of the phenomenon being studied and may employ quantitative or qualitative data (Deckert & Wilson, 2023). In this study, the descriptive research design was appropriate because it enabled the researcher to determine the levels of numeracy skills of Grade 6 learners in terms of number and algebra, geometry and measurement, and data and probability. It also allowed the researcher to examine differences in the levels of numeracy skills when respondents were grouped according to selected profile variables.

Study Respondents

The respondents of this study were all Grade Six learners enrolled for the school year 2026-2027 in one of the schools in a highly urbanized city in Negros Island Region. This study used purposive sampling, as this group was intentionally selected because they were at a crucial stage in developing numeracy skills before moving on to secondary education. By including all Grade Six learners, the study ensured that the findings were reliable and directly aligned to assess learners' numeracy performance across the three content domains.

Instrument

To gather data on the numeracy skills of Grade 6 learners, the researchers used a self-constructed questionnaire consisting of two parts. The first part gathered information on the respondents' profile in terms of sex, parents' educational attainment, and number of siblings. The second part consisted of 30 items covering three domains of numeracy skills, namely number and algebra, geometry and measurement, and data and probability.

To establish the validity of the instrument, the questionnaire was subjected to content validation by three experts using the Good and Scates validation criteria. The instrument obtained an overall validity rating of 4.93, interpreted as excellent, indicating that the items were highly appropriate and relevant for measuring the intended numeracy domains.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Furthermore, the reliability of the instrument was established through a dry run involving 30 Grade 6 learners from the same district who were not included in the actual study. Since the numeracy test items were scored dichotomously as correct or incorrect, the Kuder–Richardson Formula 20 (KR-20) was used to determine internal consistency. The instrument obtained a reliability coefficient of 0.707, interpreted as good, indicating an acceptable level of internal consistency and supporting its use in the actual data gathering.

Data Gathering and Procedure

After administering the validity and reliability tests, and upon approval of the schools division superintendent, the questionnaires were administered to the target respondents. The questionnaires were gathered, recorded, and analyzed. The data gathered from the responses of the respondents were tallied and tabulated using the appropriate statistical tools. The encoded data was processed using SPSS.

Data Analysis and Statistical Treatment

Objectives 1 and 3 employed a descriptive analytical scheme, using frequency counts and percentages as statistical tools to assess the profile of respondents, mean to assess the level of numeracy skills of Grade 6 learners across the three domains and when grouped according to the aforementioned variables. Lastly, objective 4 utilized a comparative analytical scheme, applying the Independent Samples T Test to determine significant differences in the levels of numeracy skills of Grade 6 learners when grouped and compared according to the aforementioned variables.

Ethical Consideration

By guaranteeing the confidentiality of the respondents' answers and upholding their anonymity during the entire research process, the study made a concerted effort to reduce the possibility of harm to its target respondents in accordance with Republic Act 10173, also known as the Data Privacy Act of 2012. The researchers also requested their free and informed consent upfront.

Results and Discussion:

This section presents, analyzes, and interprets the data gathered to carry out the predetermined objectives of this study.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Profile of Respondents

Table 1
Profile of the Respondents in Terms of Sex, Parents' Educational Attainment, and Number of Siblings

Variable	Category	Frequency	Percentage
Sex	Male	35	53.0
	Female	31	47.0
Number of Siblings	Few (less than 3 siblings)	31	47.0
	Many (3 siblings or more)	35	53.0
Parents' Educational Attainment	Lower (Elementary or High School)	50	75.8
	Higher (College or Master's Degree)	16	24.2
	Total	**66**	**100.00**

Table 1 shows the data on the profile of the respondents. The table showed a nearly balanced distribution which 35 or 53 percent belonged to the male category while 31 or 47 percent of the respondents belonged to the female category. The gender balance implied that numeracy interventions could be designed to benefit all learners equally. Any observed differences in numeracy performance were attributed more to instructional or environmental factors than to gender itself. According to OECD (2022) and Boaler (2021), gender gaps in mathematics performance arose from sociocultural influences rather than innate ability. Equitable classroom practices and collaborative learning environments helped minimize these gaps and raise confidence in both boys and girls.

Regarding the number of siblings, 31 or 47 percent of the respondents had few (less than 3 siblings) while 35 or 53 percent of the respondents had many (3 siblings or more). Based on the results most of the respondents came from a larger family which influenced their study habits and access to academic support. This implies that family size affected the amount of parental attention and resources available for each child. Learners from larger families developed strong social and cooperative skills but faced challenges in individualized academic reinforcement, which impacted numeracy development. Flores (2026) showed that family dynamics and parental involvement shaped mathematics achievement.

On the parents' highest educational attainment, 50 or 75.8 percent had lower educational attainment (elementary or high school), while 16 or 24.2 percent had higher educational attainment (college or master's degree). Learners from this study mostly came from households with limited formal education, this implies that lower parental education limited academic support at home and affected learners' confidence in numeracy. Parents with higher education provided stronger reinforcement and valued learning more.

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Level of Numeracy Skills of Grade 6 Learners

Table 2
Level of Numeracy Skills of Grade Six Learners According to Number and Algebra, Geometry and Measurement, Data and Probability

Areas	Mean	Interpretation
1. Number and Algebra	4.89	Nearly Proficient
2. Geometry and Measurement	4.31	Nearly Proficient
3. Data and Probability	6.00	Nearly Proficient

Table 2 level of numeracy skills of Grade Six learners in Number and Algebra, has a mean score of 4.89 interpreted as Nearly Proficient indicating moderate mastery of computation and algebraic reasoning. It implies that instruction must focus on conceptual and contextualized problem-solving activities, connecting arithmetic to algebraic reasoning. It is emphasized in the study of Kieran (2018) that algebraic thinking involves generalizing numerical relationships and expressing them through symbols, a skill that develops gradually from concrete arithmetic experiences. Similarly, Blanton and Kaput (2019) found that early exposure to algebraic concepts enhances students' ability to recognize patterns and solve problems systematically.

For Geometry and Measurement, the lowest among the three contain domain with mean score of 4.31 is interpreted as Nearly Proficient, signifying that learners have partial understanding of spatial relationships and measurement ideas but may find difficulty in relating these to real-life situations. This implies the use of manipulatives, visual aids, and real-life applications to strengthen spatial reasoning to deepen learners' knowledge of geometric and measurement principles. As explained by Clements and Sarama (2018) that geometry develops spatial reasoning and visualization, while measurement involves quantifying attributes such as length, area, and volume.

In Data and Probability, has the highest mean score of 6.00 among the three content domains, still interpreted as Nearly Proficient. This shows that learners can interpret simple data and understand basic probability but may need further development in examining variability and uncertainty. This implies that inquiry-based and contextualized tasks should be prioritized. Pfannkuch and Wild (2018) emphasized that statistical thinking involves active engagement with real-world data rather than rote memorization.

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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Level of Numeracy Skills of Grade 6 Learners When Grouped According to the Aforementioned Variables

Table 3
Level of Numeracy Skills of Grade Six Learners According to Number and Algebra, Geometry and Measurement, Data and Probability When Grouped According to Sex

Areas	Male		Female	
	Mean	Interpretation	Mean	Interpretation
1. Number and Algebra	4.91	Nearly Proficient	4.87	Nearly Proficient
2. Geometry and Measurement	4.31	Nearly Proficient	4.32	Nearly Proficient
3. Data and Probability	5.94	Nearly Proficient	6.06	Proficient

Table 3 shows the level of numeracy skills of Grade Six learners when grouped according to sex. In Number and algebra male learners obtained a mean score of 4.91, while female learners scored 4.87, with both groups interpreted as Nearly Proficient often relying on memorization rather than conceptual reasoning. The findings imply that mathematics instruction should strengthen conceptual understanding through problem-based and contextualized learning, with interventions focused on learners' needs rather than sex. This finding supports Kieran (2018), who emphasized that conceptual understanding and number sense, rather than gender, are key predictors of algebraic success.

In Geometry and Measurement, female learners 4.32 and male learners scored 4.31 with both groups rated Nearly Proficient. The insignificant difference signifies comparable spatial reasoning and measurement skills. The implies the use hands-on, visual, and real-life activities to strengthen spatial reasoning and connect geometry to everyday experiences both male and female learners engage equally in tasks regardless of sex. Clements and Sarama (2018) explained that geometry develops spatial visualization, while measurement involves quantifying attributes such as length, area, and volume. Sinclair and Bruce (2020) further noted that learners' geometric reasoning improves through hands-on activities and visual representations.

Female learners scored 6.06 interpreted as Proficient while male learners achieved a mean score of 5.94 interpreted as Nearly Proficient in Data and Probability. This slight advantage for females suggests that they may be more adept at interpreting data and understanding probability concepts. Pfannkuch and Wild (2018) emphasized that statistical thinking requires active engagement with real-world data. The result is also consistent with Garcia and Lim (2021), who reported that learners perform better in data and probability when instruction incorporates real-life data analysis, inquiry-based learning, and contextualized mathematical activities. The higher performance of female learners may reflect stronger analytical and interpretive skills, aligning with OECD (2022) findings that girls often outperform boys in data interpretation tasks due to higher attention to detail and contextual reasoning. The findings imply that mathematics instruction should emphasize authentic data interpretation and real-world problem-solving to strengthen statistical reasoning. Support should be provided based on learners' needs rather than sex.

Online ISSN: 3082-5121
Aloysian Interdisciplinary Journal of Social Sciences, Education, and Allied Fields
https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Table 4

Level of Numeracy Skills of Grade Six Learners According to Number and Algebra, Geometry and Measurement, Data and Probability When Grouped According to Number of Siblings

Areas	Few Mean	Interpretation	Many Mean	Interpretation
1. Number and Algebra	4.61	Nearly Proficient	5.14	Nearly Proficient
2. Geometry and Measurement	4.06	Nearly Proficient	4.54	Nearly Proficient
3. Data and Probability	6.06	Proficient	5.94	Nearly Proficient

Table 4 presents the data on the level of Numeracy Skills of Grade six learners according to number and algebra, geometry and measurement, data and probability when grouped according to number of siblings reveal that learners with many siblings (3 siblings or more) generally performed slightly better than those with few siblings (less than 3 siblings), with an overall mean of 15.62 compared to 14.73, both interpreted as Nearly Proficient. The small gap suggests that sibling count has minimal impact on overall numeracy performance. The findings imply that all learners can achieve similar numeracy outcomes when provided with appropriate instructional support. This finding supports Bronfenbrenner (2023) and Orbeta and Paqueo (2021), who emphasized that academic achievement is shaped by multiple family, school, and environmental factors rather than family size alone.

In Number and Algebra, learners with many siblings got a higher mean score of 5.14 than those with few siblings with mean score of 4.61, both Nearly Proficient. This implies that children from larger families may have more opportunities for peer-assisted learning and informal practice of numerical operations. This agrees with Bronfenbrenner (2023) who said family and peer interactions can help learning. This contradicts with the study of Bernardo (2019) and Mariano (2018) who found that Filipino learners often struggle in algebra because of weak understanding and lack of contextualized activities, problems that can be worse when parental attention is divided among many children.

For Geometry and Measurement, learners with many siblings also scored higher mean of 4.54 than those with few siblings with mean score of 4.06, both interpreted as Nearly Proficient. This indicates that learners from larger families may engage more regularly in everyday tasks involving spatial reasoning and measurement, such as household chores or shared activities that reinforce geometric understanding. This suggests family interaction may help. Clements and Sarama (2018) also stressed that geometry needs focused, hands-on, and visual learning, which can be harder when parental attention is divided among many children. On the other hand, Mendoza and Reyes (2021) found that real-life and contextualized activities improve performance.

In Data and Probability, learners with few siblings obtained a higher mean score of 6.06, interpreted as Proficient, while learners with many siblings obtained a mean score of 5.94, interpreted as Nearly Proficient. This indicates that learners from smaller families demonstrated slightly stronger competencies in interpreting data and understanding probability concepts. Still the difference between the two groups is minimal, suggesting that both groups have relatively

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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

similar abilities in this content domain. The findings imply the use of real-life data activities and collaborative investigations while giving extra support to learners who are not yet proficient. Findings support the study of Pfannkuch and Wild (2018) argued that meaningful engagement with authentic data enhances learners' statistical reasoning and decision-making skills. In addition, Garcia and Lim (2021) found that learners perform better in data and probability when instruction integrates real-world data interpretation and inquiry-based learning experiences.

Table 5

Level of Numeracy Skills of Grade Six Learners According to Number and Algebra, Geometry and Measurement, Data and Probability When Grouped According to Parents' Educational Attainment

Areas	Lower Mean	Interpretation	Higher Mean	Interpretation
1. Number and Algebra	4.72	Nearly Proficient	5.44	Nearly Proficient
2. Geometry and Measurement	4.18	Nearly Proficient	4.75	Nearly Proficient
3. Data and Probability	5.84	Nearly Proficient	6.50	Proficient

Table 5 level of numeracy skills of grade six learners according to number and algebra, geometry and measurement, data and probability when grouped according to parents' educational attainment. In Number and Algebra, learners with higher-educated parents achieved a mean score of 5.44, greater the 4.72 of those with lower-educated parents. This suggests that parental education influences stronger foundational understanding of numerical operations and algebraic reasoning.

As emphasized in the study of Blanton and Kaput (2019) noted that exposure to mathematical discussions at home fosters pattern recognition and problem-solving skills. The result confirms Eccles (2023) study, who found that parental education strongly predicts children's academic success, as educated parents manage to provide richer learning experiences and guidance.

For Geometry and Measurement, learners with higher-educated parents have a mean score of 4.75, a little higher than 4.18 mean score among those with lower-educated parents, both interpreted as Nearly Proficient. This implies that parental education may influence learners' spatial reasoning and conceptual understanding of measurement. Clements and Sarama (2018) explained that geometry develops through active exploration and visualization. Parents with higher education may be more likely to engage their children in activities that involve measurement and spatial reasoning, such as household tasks or educational games.

For Data and Probability, learners with higher-educated parents achieved a mean score of 6.50 interpreted as Proficient, compared to 5.84 interpreted as Nearly Proficient for those with lower-educated parents. This difference indicates that parental education improves learners' ability to interpret data and reason about probability. Pfannkuch and Wild (2018) emphasized that statistical thinking requires active engagement with real-world data. The result aligns with OECD (2022), which reported that socioeconomic and educational backgrounds significantly affect mathematics performance, particularly in data interpretation and analytical reasoning.

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

Comparative Analyses in the Level of Numeracy Skills of Grade 6 Learners When Grouped and Compared According to the Aforementioned Variables

Table 6

Difference in the Level of Numeracy Skills of Grade Six Learners in Numbers and Algebra when Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean	T Test	p-value	*Sig. level*	Interpretation
Sex	Male	35	4.9143	0.084	0.933	0.05	Not Significant
	Female	31	4.8710				
Number of Siblings	Few	31	4.6129	-1.035	0.304		Not Significant
	Many	35	5.1429				
Parents' Educational Attainment	Lower	50	4.7200	-1.207	0.232	0.05	Not Significant
	Higher	16	5.4375				

Table 6 reveals the difference in the level of numeracy skills of Grade Six learners in number and algebra when grouped and compared according to aforementioned variables. The Independent sample T-test results were interpreted as insignificant for all variables sex, number of siblings and parents' educational attainment.

Regarding the sex, the mean score of the male group was 4.9143, while that of the female group was 4.8710, obtaining the test value of 0.084 with a p-value of 0.933. Regarding the number of siblings, the mean score of the few siblings was 4.6129, while the many siblings' category was 5.1429, obtaining the test value of -1.035 with a p-value of 0.304. With regards to parents' highest educational attainment, the mean score of the lower category was 4.700, while the higher category was 5.4375, obtaining the test value of -1.207 with a p-value of 0.232. With the p-value for all variables: sex, number of siblings, parents' highest educational attainment greater than the significant level of 0.05, the null hypothesis that the significant difference in the level of numeracy skills of grade six learners when grouped and compared according to sex, number of siblings, parents' highest educational attainment was not rejected, indicating that these demographic factors do not significantly affect learners' achievement in number and algebra.

This outcome suggests that demographic factors exert minimal influence on learners' numeracy performance, emphasizing instead the role of instructional quality and learning experiences. The finding aligns with Bernardo (2019), who argued that mathematics achievement is shaped more by classroom practices and conceptual understanding than by gender or family background. Similarly, Adam (2020) noted that evaluating numeracy across demographic variables often reveals patterns of achievement but rarely significant disparities when effective teaching strategies are in place. The results also support Boaler (2021), who found that equitable and engaging learning environments help minimize performance gaps among diverse learners.

Online ISSN: 3082-5121
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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

However, the results partially contradict Eccles (2023) and OECD (2022), who reported that parental education and socio-economic background can significantly affect academic achievement. The absence of significant differences in this study may reflect the mitigating influence of school-based interventions and teacher support, which can level the learning field for students from varying family contexts.

Overall, numeracy results showed no major differences by sex, siblings, or parents' education, highlighting that instructional quality and learning experiences matter more than demographics. This supports Adam (2020), who noted that while variables reveal achievement patterns, effective teaching is the decisive factor. Thus, interventions should focus on instructional improvement, contextualized learning, and equitable access to numeracy programs.

Table 7

Difference in the Level of Numeracy Skills of Grade Six Learners in the Area of Geometry and Measurement When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean	T Test	p-value	*Sig. level*	Interpretation
Sex	Male	35	4.3143	-0.020	0.984	0.05	Not Significant
	Female	31	4.3226				
Number of Siblings	Few	31	4.0645	-1.142	0.258		Not Significant
	Many	35	4.5429				
Parents' Educational Attainment	Lower	50	4.1800	-1.169	0.247	0.05	Not Significant
	Higher	16	4.7500				

Table 7 shows the variance in the level of numeracy skills of Grade Six learners in geometry and measurement when grouped and compared according to the aforementioned variables. The result is interpreted as Not Significant in all variables using the Independent Sample T-test.

Regarding sex, the mean score of the male group was 4.3143, while that of female group was 4.3226, obtaining the T-test value of -0.020 with the p-value of 0.984. Regarding the variable number of siblings, the mean score of the few siblings was 4.0645, while that of many siblings was 4.5429, obtaining the T-test value of -1.142 with the p-value of 0.258. Regarding the variable parents' highest educational attainment, the mean score of the lower category was 4.1800, while that of higher category was 4.7500, obtaining the T-test value of -1.169 with the p-value of 0.247. With the p-values all greater than the significant level of 0.05, the null hypothesis that the significant difference in the level of numeracy skills of Grade six learners in geometry and measurement when grouped and compared according to aforementioned variables was accepted.

This outcome suggests that demographic factors such as gender, family size, and parental education do not substantially influence learners' geometry and measurement proficiency. The result aligns with Clements and Sarama (2018), who emphasized that spatial reasoning and

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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

measurement skills develop through active discovery and visualization rather than demographic background.
However, the results partially contradict Eccles (2023) and OECD (2022), who reported that parental education and socioeconomic background can significantly affect academic achievement, including mathematics. The absence of significant differences in this study may indicate that effective classroom instruction and equitable learning opportunities can mitigate disparities arising from family background.

Geometry and measurement proficiency depends more on instructional quality and practical learning than demographics. Teachers should use contextualized, hands-on, and visual strategies to engage all learners equally, reinforcing inclusive practices and focusing interventions on conceptual understanding rather than demographic distinctions.

Table 8
Difference in the Level of Numeracy Skills of Grade Six Learners in the Area of Data and Probability When Grouped and Compared According to the Aforementioned Variables

Variable	Category	N	Mean	T Test	p-value	*Sig. level*	Interpretation
Sex	Male	35	5.9429	-0.226	0.822	0.05	Not Significant
	Female	31	6.0645				
Number of Siblings	Few	31	6.0645	0.226	0.822		Not Significant
	Many	35	5.9429				
Parents' Educational Attainment	Lower	50	5.8400	-1.064	0.292	0.05	Not Significant
	Higher	16	6.5000				

Table 8 reveals the difference in the level of numeracy skills of Grade Six learners in data and probability when grouped and compared according to the aforementioned variables. The result is interpreted as Not Significant in all variables using the Independent Sample T-test.

Regarding sex, the mean score of the male group was 5.9429, while that of female group was 6.0645, obtaining the T-test value of -0.226 with the p-value of 0.822. Regarding the variable number of siblings, the mean score of the few siblings was 6.0645, while that of many siblings was 5.9429, obtaining the T-test value of 0.226 with the p-value of 0.822. Regarding the variable parents' highest educational attainment, the mean score of the lower category was 5.8400, while that of higher category was 6.5000, obtaining the T-test value of -1.064 with the p-value of 0.292. With the p-values all greater than the significant level of 0.05, the null hypothesis that the significant difference in the level of numeracy skills of Grade six learners in data and probability when grouped and compared according to aforementioned variables was not rejected.

These findings suggest that learners' ability to interpret data and reason about probability is influenced more by instructional quality and learning experiences than by demographic characteristics. The result aligns with Watson (2017), who defined data literacy as a skill

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https://journals.aloysianpublications.com
Volume 2 Issue 8 (2026)

developed through exposure to meaningful data interpretation tasks rather than external factors. Similarly, Pfannkuch and Wild (2018) emphasized that statistical thinking improves when learners actively engage with real-world data, regardless of gender or family background. The absence of significant differences also supports Boaler (2021), who argued that equitable and engaging learning environments help minimize performance gaps among diverse learners.

However, the findings partly contradict OECD (2022) and Eccles (2023), who reported that socio-economic and educational backgrounds can influence mathematics achievement, particularly in analytical domains like data interpretation. The lack of significant difference in this study may reflect the justifying effect of effective classroom instruction and equal learning opportunities provided to all students.

The results suggest that learners, regardless of their demographic characteristics, have comparable abilities in interpreting data and understanding probability concepts. Consequently, mathematics teachers should continue implementing learner-centered, inquiry-based, and contextualized instructional strategies that provide all learners with opportunities to analyze real-world data, interpret graphs and tables, and apply probability concepts in authentic situations. This finding is aligned with DepEd (2023), which advocates equitable and inclusive mathematics instruction under the MATATAG Curriculum, and OECD (2022), which emphasizes that high-quality mathematics instruction and meaningful problem-solving experiences are key factors in improving learners' statistical literacy and numeracy competencies, regardless of their personal or family background.

Conclusion:

Based on the findings, it can be concluded that the respondents were relatively balanced in terms of sex and number of siblings, although slightly more were male and had three or more siblings. In contrast, a substantial majority had parents with lower educational attainment. Thus, the respondents represented learners from varied family backgrounds, with parental educational attainment showing the most pronounced difference in their profile distribution.

In terms of numeracy performance, it can be concluded that Grade Six learners were Nearly Proficient across all three mathematical domains. Data and Probability obtained the highest mean, followed by Number and Algebra, while Geometry and Measurement registered the lowest mean. Hence, although the learners demonstrated developing numeracy competencies, they had not yet attained consistent proficiency, with Geometry and Measurement emerging as the area requiring the greatest instructional attention.

Moreover, both male and female learners demonstrated generally comparable levels of numeracy skills. Both groups were Nearly Proficient in Number and Algebra and Geometry and Measurement, while females reached the Proficient level in Data and Probability compared with the Nearly Proficient level among males. Therefore, numeracy strengths and difficulties were

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Volume 2 Issue 8 (2026)

generally shared by both sexes, although female learners demonstrated slightly stronger performance in Data and Probability.

Similarly, learners with few and many siblings generally demonstrated comparable numeracy skills, with both groups showing Nearly Proficient performance in most domains. Learners with many siblings obtained slightly higher means in Number and Algebra and Geometry and Measurement, whereas those with few siblings reached the Proficient level in Data and Probability. Consequently, the number of siblings appears to correspond with only slight variations in numeracy performance rather than substantial differences in learners' competencies.

Furthermore, learners whose parents had higher educational attainment consistently obtained higher mean scores across all three numeracy domains than those whose parents had lower educational attainment. Nevertheless, both groups remained Nearly Proficient in Number and Algebra and Geometry and Measurement, while only learners with higher-educated parents reached the Proficient level in Data and Probability. Thus, while higher parental educational attainment was descriptively associated with better numeracy performance, the differences were not statistically significant.

On the other hand, the numeracy skills of Grade Six learners in Number and Algebra did not significantly differ according to sex, number of siblings, and parents' educational attainment. Accordingly, the null hypothesis was not rejected. It can therefore be concluded that these demographic characteristics did not significantly differentiate learners' performance in Number and Algebra.

Likewise, there were no significant differences in Geometry and Measurement when learners were grouped according to sex, number of siblings, and parents' educational attainment. Hence, learners demonstrated statistically comparable competencies in this domain regardless of the selected demographic characteristics. This suggests that interventions in Geometry and Measurement should primarily address identified competency gaps rather than be differentiated according to these profile variables.

Finally, the learners' numeracy skills in Data and Probability did not significantly differ according to sex, number of siblings, or parents' educational attainment.

Although descriptive variations were observed among the groups, these differences were not statistically significant. Overall, the findings indicate that the selected demographic characteristics did not significantly differentiate learners' numeracy skills across the three mathematical domains. Therefore, the proposed intervention plan should primarily address the common competency gaps of Grade Six learners, with particular attention to Geometry and Measurement while further strengthening Number and Algebra and Data and Probability toward full proficiency.

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