



# NUMERACY SKILLS OF BEGINNING LEARNERS: BASIS FOR A CONTEXTUALIZED MATHEMATICS PROGRAM OF GRADE TWO LEARNERS

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## ABSTRACT

*This research determined the numeracy skills of Grade Two learners in Sta. Cruz South District, Division of Davao del Sur, to support the formulation of a contextualized mathematics program. Using a non-experimental descriptive survey design, the study involved 400 learners who completed a mathematics test developed by the researcher. The assessment focused on three core skill areas: verbal counting, numerical operations, and problem-solving. Post-test results showed significant improvement from pre-test scores, with learners reaching a "Satisfactory" level in verbal counting and numerical skills, and a "Very Satisfactory" level in problem-solving. Analysis also revealed statistically significant differences in numeracy performance based on gender and school classification (urban vs. rural), highlighting the role of contextual variables in early mathematics learning. The study was anchored on Piaget's Cognitive Development Theory and Constructivist Learning Theory, emphasizing hands-on and meaningful learning experiences. Based on the findings, a contextualized mathematics program was designed to better address the learners' needs. The study recommended that educational leaders prioritize teacher training, inclusive instructional practices, and parent engagement to strengthen early numeracy foundations.*

**KEYWORDS:** Numeracy Skills, Beginning Learners, Basis for a Contextualized Mathematics Program, Grade Two Learners

## INTRODUCTION

Learning to count, identify numbers, compare, and manipulate quantities are key early numeracy skills. These skills are strong predictors of school-age mathematical learning and performance. General neurocognitive abilities, such as working memory and language, are also crucial for developing early numeracy. It is recommended that early assessment for risk of mathematical learning difficulties include tests in both early number knowledge and key neurocognitive abilities. Math-specific interventions are most effective for enhancing early numeracy. Currently, there is little evidence that training in general cognitive functions transfers to mathematical learning.

Although numeracy is far less studied than literacy, it is as important as literacy for predicting productivity, wages, and employment outcomes, and the cost of innumeracy to individuals and society is high. In recent years, analyses of data from large national longitudinal databases such as the Early Childhood Longitudinal Study have shown that children's mathematical knowledge at school entry is the strongest predictor of both later math success as well as success in other academic domains (Ducar, 2021).

Early numeracy is an umbrella term encompassing several skills, such as verbal counting, knowing the number symbols, recognizing quantities, discerning number patterns, comparing numerical magnitudes, and manipulating quantities. Such informal math skills are acquired before or outside of the school setting. In comparison, formal math knowledge is acquired through explicit teaching within the school setting, such as instruction in the concepts and steps involved in regrouping in multi-digit addition and subtraction (Fevre 2022).

For most children, acquisition and mastery of early numeracy skills occur spontaneously through activities in the home and other experiences in the child's everyday environment, though this is not true for all children. For example, children from low socioeconomic status households often demonstrate less well-developed numerical knowledge during the preschool years and kindergarten than their middle-income peers (Casey, 2021).

Children with learning difficulties, especially those linked to neurodevelopmental disorders, often struggle to acquire informal mathematical knowledge. Consequently, children with low number skills at kindergarten entry are at risk for poor math achievements in the elementary grades. Early intervention is crucial to support these children and prevent long-term math difficulties. (Nelwan et al. 2021).

Numeracy skills are essential for young learners, forming the foundation for future mathematical learning and overall academic success. In the Philippines context, however, many beginning learners face challenges in acquiring basic math concepts such as counting and addition, influenced by factors like language barriers, socio-economic backgrounds, and cultural differences (Sanchez et al., 2020). As the education system evolves, there is an increasing need for a mathematics program that is responsive to the local context and the unique needs of Filipino students.



In the Division of Davao Del Sur, particularly in numerical skills among learners in grade two, is an academic issue, young children have difficulty to master the competency in early mathematics. The researcher, being a teacher in grade two, would like to explore the possible resolution of the problem. Hence, this study.

## LITERATURE REVIEW

Numeracy skills are vital for functioning effectively in everyday life and play a crucial role in personal and professional settings. These skills go beyond basic arithmetic and involve the ability to understand, interpret, and apply mathematical concepts such as fractions, percentages, and data analysis. Numeracy is not only about solving math problems but also about making informed decisions based on quantitative information, which is crucial in many aspects of life (OECD, 2020). Whether budgeting at home or analyzing data at work, numeracy enables individuals to engage confidently with the world around them. As society becomes more dependent on data and numbers, strong numeracy skills are more necessary than ever.

In addition to general decision-making, numeracy skills significantly enhance individuals' ability to make informed decisions in various areas of life, such as health and finances. For example, understanding statistics and probabilities allows people to evaluate risks and make choices grounded in logic rather than intuition. Research has shown that individuals with stronger numeracy skills are better equipped to assess information and make decisions that align with their long-term goals (Zheng et al. 2021). In today's world, where data-driven decisions are increasingly common, these skills are indispensable for evaluating complex scenarios and determining the best course of action.

One of the most important real-world applications of numeracy is in financial literacy. Managing personal finances—such as budgeting, saving, investing, and understanding loans or mortgages—requires a solid understanding of numeracy. Studies show that individuals with weaker numeracy skills often struggle to manage their finances effectively, leading to poor decision-making, economic instability, and increased debt (Gordy, 2022). Conversely, numerate individuals are more likely to make better economic decisions, such as saving for the future or avoiding high-interest debt, which contributes to greater economic security and stability. Thus, improving numeracy skills is key to fostering financial independence and well-being.

In the professional realm, numeracy skills are indispensable in fields like engineering, finance, healthcare, and technology, where the ability to work with data and solve quantitative problems is crucial. Professions that require constant numerical analysis, such as accounting, data analysis, and project management, rely heavily on numeracy skills to make decisions, track progress, and optimize results. Research shows that employees with higher numeracy skills are more productive and perform better in their roles, often leading to career advancement and higher earnings (OECD, 2021). As technology continues to evolve, the demand for proficient workers in numeracy and data interpretation is only expected to grow, making these skills essential for navigating the modern job market.

Given the broad implications of numeracy skills for both personal and professional success, it is critical to invest in improving numeracy education across society. Governments, educational institutions, and organizations must prioritize the development of these skills, particularly for underserved populations, to ensure equal opportunities for success. Research consistently shows that investing in numeracy education has significant benefits, including increased productivity and economic participation (OECD, 2021). By enhancing numeracy skills, we can help individuals build a stronger foundation for personal success, contribute to a more informed workforce, and tackle broader societal challenges such as inequality and economic instability.

## Statement of the Problem

This study aimed to determine the level of numerical skills of the learners in grade two and develop a contextualized mathematics program. Specifically, it answered the following sub-problems:

1. What is the level of the numeracy skills of the grade two learners in terms of:
  - 1.1 Verbal counting skills,
  - 1.2 Numerical skills,
  - 1.3 Problem-solving skills?
2. Is there a significant difference in the numeracy skills of grade two learners when analyzed by gender?
  - 2.1 Male
  - 2.2 Female
3. Is there a significant difference in the numeracy skills of grade two learners when analyzed by type of school?
  - 3.1 Urban
  - 3.2 Rural
4. Based on the findings drawn from this study, what contextualized mathematics program for grade two learners can be designed and proposed?

## METHODOLOGY

### Research Design

This study used a non-experimental descriptive survey research design to examine the research problem. It was descriptive because the data were presented in quantitative descriptions on the “Numeracy Skills of Beginning Learners: Basis for a Contextualized Mathematics Program in Grade Two Learners. According to Creswell (2020), this research method merely describes tasks presenting the conditions regarding the nature of the group



of persons or class of events that involve the procedure of analysis, classification, and measurement. It involves varied information regarding the current or present condition (Deauna, 2020).

In this context, a descriptive survey aimed to systematically collect data on the current level of numeracy skills among students just starting their educational journey. This survey typically involves structured questionnaires or interviews designed to capture various variables, such as basic mathematical knowledge, problem-solving abilities, and understanding of mathematical concepts. By utilizing descriptive statistics, the survey helps to analyze patterns, identify gaps in knowledge, and explore factors influencing numeracy development. The findings can then inform educational practices and interventions to support early learners in enhancing their numeracy skills (Creswell, 2020).

### Research Respondents

This study was conducted in the elementary schools of Sta. Cruz South District, Division of Davao Del Sur. The respondents in this study were the 1,178 grade two learners in the research locality who were enrolled in School Year 2024-2025 in the elementary schools in the Santa Cruz South District. A total of 1,178 grade two learners took the mathematics test constructed by the researcher, which was adopted from the Department of Education's 2022 Rapid Mathematics Assessment (RMA). Slovin's formula was used to determine the sample size; the total number of grade two learners in the Santa Cruz South District is 1,178. Computed using Slovin's formula, the sample size for this research is 400. This study used the simple random sampling procedure, considering that there was a massive number of grade two learners in Sta. Cruz South District. The respondents of the study were distributed across five elementary schools in the Santa Cruz South District, and the respondents were as follows: 100 from Santa Cruz Central Elementary School, 100 from Agripina Elementary School, 100 from Tuban Elementary School, and 50 from Anastacio G. Canda Elementary School. Lastly, 50 from Apolinar Franco Sr. Elementary School.

### Research Instrument

This study utilized the researcher-developed questionnaire, whose items and indicators were focused on the numeracy skills of the grade two learners. It was a 20-item test based on the mathematics competency for grade two. The researcher-made test-type questionnaire was pilot tested in a school not part of the research locally to measure its validity and reliability.

### Data Analysis

The following statistical tools were used in the analysis and interpretation of the responses in this study. Mean was used to describe the level of numeracy skills of the grade two learners. The Mean is the average of a set of numbers. It is calculated by adding all the numbers in the set and dividing the sum by the total number of data values given in the set.

A T-test was used to determine the significant difference in the numeracy skills of grade two learners when analyzed by gender and type of school. The t-test is a statistical method used to compare the means of two groups or samples to determine if there is a statistically significant difference between them. It is often employed in hypothesis testing to assess whether a treatment or process affects a population or if the differences observed are due to random chance.

## RESULTS AND DISCUSSION

### Conclusion

Based on the collective findings of this study, the following conclusions are drawn:

The level of numeracy skills of grade two learners in terms of verbal counting skills is Satisfactory, the level of numeracy skills of grade two learners in terms of numerical skills is Satisfactory, the level of numeracy skills of grade two learners in terms of problem-solving skills is Very Satisfactory, the numeracy skills of grade two learners is Satisfactory, there is a significant difference on the numeracy skills of the male and female grade two learners, there is a significant difference on the numeracy skills of the rural and urban grade two learners.

These findings compliment the Cognitive Development Theory of Jean Piaget, which suggests that children progress through distinct stages of cognitive development, which influence their ability to understand numerical concepts. In the preoperational stage (ages 2–7), children begin to grasp symbolic representation, allowing them to associate numbers with objects. As they move into the concrete operational stage (ages 7–11), they develop logical reasoning and the ability to perform basic arithmetic operations. Educators can use hands-on activities and manipulatives to support numeracy development in alignment with Piaget's framework.

Another theory that supports the findings of this study is the Constructivist Learning Theory. This theory, rooted in Piaget's ideas, emphasizes that children construct mathematical knowledge through experiences and interactions. Grade two learners develop numeracy skills through problem-solving activities, collaborative learning, and real-world applications. Using manipulatives, storytelling, and play-based learning enhances their ability to understand numerical relationships and patterns.

### Recommendations

In light of the findings drawn out by the researcher in this study, the following recommendations are offered:



It is recommended that DepEd officials prioritize the integration of research-backed instructional methods into the curriculum. Emphasizing hands-on learning through manipulatives, visual aids, and real-world applications can enhance students' foundational mathematical understanding. Additionally, adopting differentiated instruction to cater to diverse learning needs ensures that every child receives targeted support. Officials may also consider incorporating technology-driven tools such as interactive games and digital platforms to foster engagement and dynamically reinforce numeracy concepts.

Furthermore, DepEd may invest in comprehensive teacher training programs focused on early numeracy development. Equipping educators with effective teaching strategies, assessment techniques, and intervention plans can significantly improve student outcomes. Providing continuous professional development opportunities and encouraging teacher collaboration can help refine best practices in numeracy instruction. Additionally, strengthening partnerships with parents and communities through workshops and resource-sharing initiatives can create a supportive learning environment, ensuring that numeracy skills are reinforced beyond the classroom. By implementing these measures, DepEd can lay a strong foundation for mathematical proficiency among young learners.

The School heads may implement evidence-based instructional approaches that foster mathematical understanding. Encouraging teachers to integrate hands-on activities such as manipulatives, visual aids, and interactive storytelling can make abstract numerical concepts more accessible to young learners. Additionally, promoting play-based and experiential learning methods ensures students develop a strong foundation in mathematics through engaging and meaningful experiences. School leaders may also support differentiated instruction by providing resources for individualized learning plans, allowing students to progress at their own pace while receiving targeted interventions as needed.

Moreover, school heads may prioritize continuous professional development of teachers to strengthen their expertise in early numeracy instruction. Organizing workshops focused on innovative teaching strategies, assessment methods, and intervention techniques can empower educators to address diverse learning needs effectively. Collaboration among teachers through mentorship programs and peer discussions can facilitate the exchange of best practices, enriching the teaching environment. Furthermore, engaging parents and the community in numeracy development through family math nights and resource-sharing initiatives can reinforce learning beyond the classroom. By fostering a holistic approach to numeracy education, school heads can ensure that young learners acquire the necessary skills for future academic success.

Teachers may integrate manipulatives, visual aids, and real-life scenarios into their lessons, helping students understand abstract concepts through hands-on experiences. Additionally, fostering a positive learning environment where students feel encouraged to explore numbers and problem-solving without fear of mistakes can boost their confidence. Differentiated instruction may also cater to diverse learning styles, ensuring each child receives the necessary support to build strong numeracy foundations.

Beyond classroom strategies, teachers may actively collaborate with parents and caregivers to reinforce numeracy development at home. Practical activities such as counting objects, playing math-related games, and incorporating numbers into daily routines can strengthen children's understanding of mathematical concepts. Regular assessments and tailored interventions for struggling students are also essential, enabling teachers to address learning gaps early. By utilizing innovative teaching methods and fostering partnerships with families, educators can create a holistic approach that ensures learners build strong numeracy skills essential for future academic success.

Future researchers may consider investigating the impact of various teaching methodologies, including play-based learning and technology-enhanced instruction, on mathematical comprehension. Additionally, examining socio-economic factors, parental involvement, and teacher competency could provide valuable insights into disparities in numeracy development. Longitudinal studies assessing how early interventions influence long-term mathematical ability may also be beneficial. Future research may aim to develop evidence-based strategies that foster foundational numeracy skills, ensuring learners build strong mathematical understanding from the early stages of education

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