



# Analysis of Enhanced-Regional Unified Numeracy Test (E-RUNT) Results: Basis for a Contextualized Numeracy Management Program

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## ABSTRACT

This qualitative research aimed to develop a tailored numeracy management program based on the analysis of the Enhanced-Regional Unified Numeracy Test (E-RUNT) and insights from Grade 6 Mathematics teachers and learners in the Schools District of Leganes, Schools Division of Iloilo, during the School Year 2022-2023. Data was collected using a standardized E-RUNT and a validated interview guide. The study included 98 non-numerate learners identified through total enumeration, with 11 learners and 10 teachers selected for interview through purposive sampling. Findings showed that male learners predominated among Grade 6 non-numerates, with fewer having parents with higher education and many facing socioeconomic challenges. Identified learning gaps included a lack of mastery in fundamental operations, insufficient practice, and weak number sense. Teachers encountered challenges such as learners' negative attitudes, frequent absences, time constraints, and readiness issues. Various coping strategies were employed by teachers. The study's outcomes informed the development of a contextualized numeracy management program for implementation across the district.

Keywords: *E-RUNT, Numeracy Program, Qualitative Research, Mathematics Teaching, Leganes, Iloilo, Philippines*

## Introduction

### *Background of the Study*

Mathematics is often feared and regarded as challenging by students, but its difficulty can be influenced by students, teachers, and their learning environment (Langoban&Langoban, 2020; Subia et al., 2018). Teachers play a key role in shaping students' attitudes towards math. Mastery of mathematical concepts is crucial for understanding subjects like science, social studies, and the arts, and is also essential for achieving the UN's Sustainable Development Goal 4, which emphasizes quality and inclusive education.

In response to the negative impact of the pandemic on numeracy, the Department of Education, Regional Office VI (DepEd-RO VI) introduced the Enhanced-Regional Unified Numeracy Test (E-RUNT) in December 2022. This initiative aims to evaluate and improve students' numeracy skills. Preliminary results indicated that 17.72% of Grade 6 students in Leganes were not proficient in basic math operations, highlighting significant learning gaps (DepEd-RO VI, 2022). This situation puts pressure on both teachers and parents and requires immediate intervention.

This research aims to analyze the E-RUNT results and identify learning gaps as perceived by mathematics teachers. The findings will inform the development of a contextualized numeracy management program for the Schools District of Leganes for the 2022–2023 school year, with the goal of enhancing teachers' math teaching skills and improving students' numeracy proficiency and confidence (DepEd-RO VI, 2022).

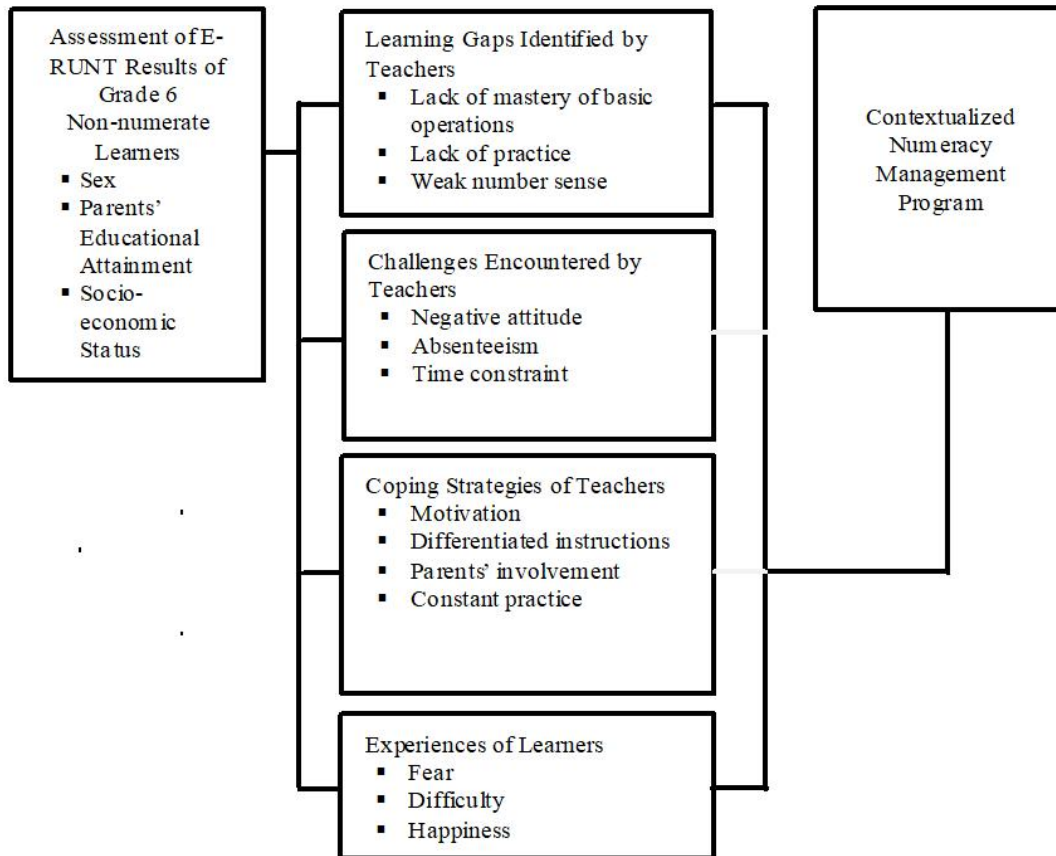
### *Theoretical Perspectives*

This study was deeply influenced by personal constructivism, which underscores how learning is facilitated through existing conceptual frameworks (Ferreira & Marques, 2024). It acknowledges the role of interaction with others and cultural tools in shaping understanding. Constructivism offers valuable insights into classroom dynamics, informing curriculum development and pedagogy. Additionally, the study drew upon Social Cognitive Theory (SCT), stemming from Albert Bandura's Social Learning Theory. SCT highlights the social context of learning and the interplay between individuals, environment, and behavior, emphasizing social influence and past experiences in shaping behavior. By employing SCT, the research explored the impact of various factors on numeracy skills, including students' self-efficacy beliefs and environmental influences. The aim was to understand how learners' confidence affected their engagement and effectiveness in numeracy activities, identifying effective interventions and teaching strategies. Overall, SCT provided a comprehensive framework for understanding the intricate dynamics of numeracy skills development. The researcher's goal was to transform mathematics into an enjoyable, interactive, and educational experience for both students and teachers.

### Conceptual Framework

The purpose of this study was to create a tailored numeracy management program by analyzing the E-RUNT outcomes and gathering input from Grade 6 Mathematics teachers in the Schools District of Leganes, Schools Division of Iloilo, for the School Year 2022-2023. The independent variables consisted of the E-RUNT assessment results for Grade 6 students. Dependent variables included the learning gaps identified by mathematics teachers, challenges encountered, coping strategies employed, and the learners' experiences during the E-RUNT examination, as depicted in Figure 1.

**Figure 1 - Paradigm of the Study Showing the relationship of the Variables**



#### .Purpose of the Study

This study aimed to come up with a contextualized numeracy management program based on the analysis of the E-RUNT results and the insights of Grade 6 Mathematics teachers and learners in the Schools District of Leganes, Schools Division of Iloilo, during the School Year 2022-2023.

Specifically, this study answered the following questions:

1. What is the profile of Grade 6 non-numerate learners in terms of sex, parents' educational attainment, and parents' socioeconomic status?
2. What are the learning gaps identified by Grade 6 mathematics teachers based on the results of the Enhanced-Regional Unified Numeracy Test (E-RUNT)?
3. What are the challenges encountered by Grade 6 mathematics teachers in the implementation of the Enhanced-Regional Unified Numeracy Test (E-RUNT)?
4. How do the Grade 6 mathematics teachers cope with these challenges?
5. What are the experiences of Grade 6 non-numerate learners in taking the Enhanced-Regional Unified Numeracy Test (E-RUNT)?

### Methodology

This study utilized qualitative research methodology, aiming to collect and analyze non-numerical data to comprehend individuals' social reality, encompassing their attitudes, beliefs, and motivation (Fraenkel, Wallen & Hyun, 2012). Qualitative data were derived from interviews conducted with

Grade 6 Mathematics teachers and Grade 6 non-numerate learners in the Schools District of Leganes, and thematic analysis was employed to present and analyze the gathered data.

The 10 teacher-participants were purposively selected based on specific inclusion criteria: teaching with non-numerate students, possessing a minimum of five years of teaching experience in Mathematics, and receiving a recommendation from the school head. The 11 learner participants were included if they were recommended by a Mathematics teacher.

Developed by the DepEd, the E-RUNT tool evaluates proficiency in addition, subtraction, multiplication, and division, with equal weight given to each operation. Learners had 15 minutes to complete the 40-item assessment. Scoring criteria categorized learners as numerate if they achieved at least 80% accuracy, based on guidelines outlined by DepEd. Demographic information, including sex, parents' education, and household economic status, was collected alongside the assessment. Meanwhile, the individual questions in the interview guide, designed to gather qualitative data, were subjected to the evaluation of the panel of experts.

The study employed both descriptive and inferential statistics. Descriptive statistics included frequency count, percentage, mean, and standard deviation. Additionally, thematic analysis, following Braun and Clarke's (2006) framework, was conducted. This involved transcribing interview recordings and coding stages for analysis.

The study was conducted under the rigors of research ethics. Written informed consent from both learners' parents or legal guardians was obtained. Ethical considerations included voluntary participation, informed consent, anonymity, confidentiality, minimizing harm, and disclosing potential conflicts of interest. Safeguards were implemented to protect participants' well-being and privacy, ensuring transparency, academic honesty, and integrity in result communication.

## Results and Discussion

### *Profile of Non-numerate Learners*

Results showed that a majority of the non-numerate learners were male (61.25%), with females comprising 38.8%. Regarding parents' educational attainment, the highest proportion had completed secondary education (34.7%), followed by college graduates and high school graduates. In terms of socioeconomic status, most parents fell into the poor category (less than P12,082), while others were classified as low-income or lower-middle-income. The data are shown in Table 1.

**Table 1**

*Profile of the Respondents According to Each Category*

Profile	Frequency	Percent
As a whole	98	100
Sex		
Male	60	61.2
Female	38	38.8
Parents' Educational Attainment		
Elementary Level	18	18.4
Secondary Undergraduate	16	16.3
Secondary Graduate	34	34.7
College Undergraduate	15	15.3
College Graduate	15	15.3
Economic Status		
Poor	59	60.2
Low-income class	26	26.5
Lower middle-income class	13	13.3

The study highlighted that male students predominated among non-numerate learners, suggesting a correlation between gender and poor numeracy performance, as also highlighted by the study of Tanghal and Tanghal (2022). Furthermore, parental educational attainment correlates with the frequency of numeracy support provided to children. Those with higher education levels tend to offer more support, as indicated by Anders et al. (2011).

On the other hand, socio-economic status significantly predicts both learner and school achievement, with family income being a stronger predictor of mathematical skills than parental education level.

### ***Learning Gaps Identified by Grade 6 Mathematics Teachers***

In-depth interviews with Grade 6 Mathematics teachers revealed several learning gaps identified based on the results of the E-RUNT. These included deficiencies in fundamental operations, insufficient practice, and a weak grasp of number sense among students. The details of these learning gaps were presented in Table 2 (Appendix C), offering insight into specific areas where students struggled in mathematics. This information was valuable for informing targeted interventions and instructional strategies aimed at addressing these identified gaps and enhancing students' mathematical proficiency.

*Lack of Mastery of Fundamental Operations.* Regarding mastery learning, participants underscored the necessity of providing adequate time and support for students to grasp mathematical concepts fully. As reiterated by Participant 5, "Some of my pupils lack mastery; they found it hard for themselves to cope with those learnings that they were supposed to have mastered." This result is validated by the study of Cicerchia (2020). Various research (Berlamino et al., 2018; Pelkola, Rasila&Sangwin, 2018) also emphasized the importance of not advancing students until they have mastered the material, in line with Benjamin S. Bloom's theory.

*Lack of Practice.* Insufficient practice was identified as a key obstacle, with participants noting that learners lacked practice in basic operations, hindering their problem-solving abilities and overall math proficiency. Time constraints, lack of computational skills, and insufficient hands-on experience were cited as contributing factors to this issue, as underscored by Participant 8, "...of course, the time constraint, some of the learners were under pressure... to finish the test on time."

*Weak Number Sense.* This encompassed struggles with basic operations, conceptual understanding, and recognizing number patterns (Jordan et al., 2023). Participants emphasized the importance of fostering number sense through hands-on activities and explicit teaching of mathematical concepts, as narrated by Participant 10, "...in subtracting a 2-digit number, they directly subtract the digits with the higher value without regrouping."

### ***Challenges Encountered by Grade 6 Mathematics Teachers***

During the implementation of the E-RUNT, Grade 6 Mathematics Teachers encountered several obstacles, as reported by respondents in interviews. Challenges included students' negative attitudes toward math learning, high rates of student absenteeism, time constraints, and differences in students' readiness to grasp mathematical concepts, as shown in Table 3 (Appendix D).

*Learners' Negative Attitude.* The negative attitude of learners towards mathematics was highlighted as a significant challenge, impacting their engagement and learning outcomes. Participants noted difficulties such as lack of concentration, impatience, and poor study habits among students. "Some lack of patience, lack of effort to do the activities," explained by Participant 1. Addressing these challenges requires understanding effective teaching practices and implementing early intervention programs (Clerkin& Gilligan, 2018) Additionally, participants emphasized the importance of parental involvement in shaping students' study habits.

*Frequent Absences of Learners.* Participant 1 and Participant 2 highlighted absenteeism as a significant issue during the implementation of interventions. They emphasized the challenges of supporting absent students and the importance of understanding the reasons behind their absence. Individualized interventions tailored to address the root causes of absenteeism were recommended. Brant (2017) further explained that absenteeism can stem from various reasons, both internal and external to the school, and may be motivated by factors such as lack of motivation or deliberate choice. Understanding these factors is crucial for effectively addressing absenteeism.

*Limited Time to Accomplish.* Perceptual Time Theory suggests that individuals' perception of time is influenced by various factors, including attention and motivation. Understanding how individuals perceive time can aid in optimizing work processes within these constraints. During the implementation, Participant 3 noted challenges with learners unable to finish tasks within the allotted time. Participant 4 highlighted difficulties faced by slower learners, while Participant 5 expressed concerns about insufficient time for learning in school. These observations underscore the impact of time constraints on learning outcomes and student well-being (Darmayanti et al., 2023).

### ***Teachers' Coping Strategies in Teaching Mathematics***

During the implementation of the Enhanced-Regional Unified Numeracy Test (E-RUNT), Grade 6 Mathematics teachers discussed their coping strategies for the challenges they faced. These included motivating learners, implementing differentiated instruction, providing varied activities, involving parents, implementing remedial teaching, and ensuring constant practice, as shown in Table 4 (Appendix E).

*Motivating Learners.* Motivation plays a crucial role in academic achievement, with studies emphasizing its significance. Self-Determination Theory suggests that autonomy, competence, and relatedness are key motivators for learners. Lack of control, confidence, or connection to others can diminish motivation and hinder learning. Participants 1 and 2 highlighted strategies such as individualized encouragement and reward systems to motivate learners. Utilizing principles of motivation like competence, belongingness, autonomy, and meaningful learning can enhance students' motivation and academic success (Bracket, 2016).

*Implementation of Differentiated Instructions.* “Understanding each learner's unique needs and learning styles is crucial for effective differentiation,” as emphasized by Participant 8. Participant 10 stressed the importance of introducing assessments like the E-RUNT to tailor instruction accordingly and address challenges proactively. These strategies align with research emphasizing the importance of differentiated instruction in improving math performance, as demonstrated by studies such as Bender and Strang (2021) and Chavez (2018). Adopting differentiated instructional strategies is essential for catering to diverse learning needs and promoting student success in mathematics.

*Involving Parents.* Parental involvement in education is crucial for ensuring children's academic success and overall development. Lev Vygotsky's sociocultural theory emphasizes the role of parents in shaping children's cognitive and social development through meaningful interactions. Participants highlighted various ways to involve parents, such as conducting parent conferences, encouraging collaboration between parents and educators, and providing support for parents to engage in their child's learning. Research (Belleza, 2022; Topor et al., 2021) consistently shows a positive correlation between parental involvement and academic performance across different ethnic backgrounds, educational goals.

*Providing Constant Practice.* Consistent practice is crucial for improving learners' performance in mathematics, emphasizing repeated engagement with mathematical problems and concepts. This principle, supported by Thorndike's Law of Exercise, suggests that reinforcing associations strengthens learning outcomes while neglecting them weakens understanding over time. Participants highlighted various strategies for constant practice, such as conducting daily drills, intervention plans, and remediation schedules. Research by Ramachandran and Lutovac (2019) underscores the importance of regular practice in promoting better understanding, problem-solving skills, and critical thinking abilities in mathematics and science education.

### ***Experiences of Learners in Taking the E-RUNT***

The study also explored the experiences of Grade 6 non-numerate learners during the E-RUNT administration. Learners expressed a range of emotions, including anxiety, struggles with comprehension, and moments of happiness and satisfaction. Table 5 (Appendix F) outlines the identified codes and themes summarizing these experiences.

*Anxiety in Taking E-RUNT.* Participant 1 underscored, “*Nahadlukan kay indi ko gawakabalomagdividekagbasiindikapasar* (I had fear because I am not good in division and maybe I can't pass). Math anxiety and fear often stem from a lack of connection between students and the subject, leading learners to perceive math as difficult and intimidating. Test Anxiety Theory highlights how excessive anxiety can hinder performance in test situations. Participants expressed their fears during the E-RUNT administration, citing concerns about their ability to pass and the time limit. Aguilar's (2021) research further explores factors contributing to students' apprehension towards mathematics, including perceived lack of interest, comprehension, and confidence.

*Difficulty in Understanding.* Mathematics demands focus and regular practice for success. Learners often struggle with math problems due to a lack of understanding of basic facts and concepts. Constructivism theory, associated with Piaget and Vygotsky, highlights the importance of active engagement and exploration in learning environments. Participants expressed difficulties, especially in division, multiplication, and subtraction. Mastery of these fundamental operations is crucial for advancing in math. However, learners may struggle when problems lack context or relevance. Linkletter (2023) notes that math's abstract nature can pose challenges, requiring students to work harder and practice more to grasp complex concepts.

*Happiness and Sense of Satisfaction.* Answering questions correctly and performing well on tests can evoke feelings of success and pride, contributing to a positive emotional state. This happiness varies among individuals and is influenced by factors like engagement and immersion, as emphasized in Flow Theory. Participants expressed happiness in successfully completing tests. Despite math's reputation for difficulty, solving complex problems can bring deep satisfaction. Das (2017) suggests understanding concepts rather than memorizing formulas for a more enjoyable math experience.

### ***Proposed Contextualized Numeracy Management Program***

The results of the study served as the basis for the drafting of the proposed contextualized numeracy management program. The insights were primarily drawn from the interviews conducted with the Grade 6 teachers and the learners. The rationale and goals of the proposed program is roughly presented below.

#### ***Rationale***

Mathematics is a core subject at every school level until college because every person applies basic mathematics in everyday life. It has become evident that mathematics is very important and should be studied by all learners at school. However, most of the learners in the country are still unable to master mathematics very well.

Due to modernization, the curriculum of mathematics kept on changing and advancing, while the government must undergo some changes, especially the teaching methods from traditional to modern, where, which may allow the students to understand the concepts in a distinctive way.

The enhancement of the quality of basic education in the Philippines is urgent and critical during President “Ninoy Aquino’s administration. The implemented k-12 model in the country is an educational system from elementary and secondary education patterned after the United States of America, Canada, and some parts of Australia (Belarmino et al., 2018).

The Department of Education reasons that it is high time to adopt a K to 12 system, attributing the low performance and poor quality of basic education to the present set-up. In the implementation of the program, the twin goals of mathematics are critical thinking and problem-solving. This serves as the focal point in learning mathematics.

However, the four operations in mathematics are mathematical functions that take input values and convert them into output values. They are addition, subtraction, multiplication, and division. The four fundamental operations are the cornerstone of mathematics, and as such, they are an important part of math lessons at school. It is important for children to become confident in using the four fundamental operations so that they can build on those basic skills in real life and in future math lessons.

### **Objectives**

The objectives of this proposed contextualized numeracy management program are to:

1. mainstream or integrate these Grade 6 non-numerate learners with regular classes through proper guidance of their respective math teachers;
2. develop and maximize values of learning to let the learners apply the order of operations correctly when evaluating a number expression;
3. communicate the focus of learning that will enable teachers and learners to work toward a common goal;
4. develop strategies among teachers that will address the challenges they encounter in teaching Math;
5. establish guidelines called the order of operations, which outlines the order in which parts of an expression must be simplified; and
6. build a solid understanding of the fundamental knowledge among Grade 6 learners to boost their motivation and confidence.

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### **Conclusion**

Non-numerate learners, often male students from disadvantaged backgrounds, face additional hurdles in acquiring numeracy skills. Recognizing their demographic profile is crucial for designing interventions to meet their specific needs.

Teachers observe gaps in students' foundational skills, impeding their academic progress and ability to handle advanced topics effectively. Closing these gaps is essential for providing targeted support.

Mathematics teachers encounter challenges during the implementation of E-RUNT, including students' attitudes towards learning math and their lack of preparedness due to incomplete mastery.

Teachers use diverse strategies to cope with these challenges, addressing both cognitive and psychological aspects of learning. Involving parents in the learning process is highlighted as beneficial.

Learners' experiences with E-RUNT vary, with some feeling anxious, others finding satisfaction in completing the test, and some struggling to grasp it. This underscores the necessity for tailored support and understanding of individual learner needs.

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### **Recommendations**

Teachers should employ creative approaches to address the unique personalities and reasons behind students' struggles in mathematics. Differentiated instruction is suggested to accommodate individual learning differences effectively.

Emphasize the importance of parental engagement in their children's academic journey, recognizing that education is a shared responsibility between schools and parents.

Consider adopting a longitudinal study approach to assess the sustainability of interventions aimed at improving the mathematics performance of non-numerate students, allowing for a comprehensive analysis of learning dynamics over time.

Expand the research scope to include participants from various regions or districts to capture a broader range of experiences related to E-RUNT implementation, enabling better generalizability of findings and informing policy and practice at different levels.

Compare interventions implemented by schools in different districts to identify best practices and areas for improvement, potentially informing future research related to E-RUNT implementation.

Establish a feedback mechanism involving regular surveys or sessions with learners and parents to monitor the effectiveness of interventions and adapt strategies based on real-time insights.

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