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## **ANALYSES OF LEARNERS' MATHEMATICAL SKILLS USING ENHANCED-REGIONAL UNIFIED NUMERACY TEST (E-RUNT): BASIS FOR INTERVENTION PROGRAM**

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### **ABSTRACT**

The study aimed to determine the mathematical skills of learners using the E-RUNT. The participants of the study were 100 grade 11 learners of Calaya National High School. After the analyses of scores, 48 came out to be non-numerates. The Enhanced-Regional Unified Numeracy Test (E-RUNT) was utilized to measure the mathematical level of learners and a researcher-made in-depth interview guide was used for the qualitative inquiry. The result showed that learners' mathematical skills were overall "Average". When classified in terms of Addition, the level of mathematical skills was "Good" and "Average" for Subtraction, Multiplication and Division. The emergent themes for the Common Errors of Learners were centered on misunderstanding the value of signed numbers for addition, misled by the signs for subtraction, incomplete mastery of number facts for multiplication, and division deals with getting entangled by the integers and word problems. Based on the result of the study the difficulties of learners primarily centered on

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incomplete understanding of the language of math and misconception of Mathematics as a subject and an intervention program was proposed.

**Keywords:** *Learners' Mathematical skills, E-RUNT, Intervention Program*

## INTRODUCTION

Education is unquestionably among the most crucial components in creating a person's resource, which is essential for the progress of a human being. Any person's whole cognitive, skill, and attitude development is significantly influenced by education. It consists of a variety of subjects that every person should be taught and instructed in. One of the oldest fields, mathematics is a subject that is essential to preparing an individual for development. As a result, it is seen as a universal science that guides the creation of contemporary technology and plays a significant part in providing solutions to everyday issues (Graciella, 2016; Dewimarni, 2017).

According to the K–12 Basic Education Curriculum, students should have a thorough understanding of the subject's guiding principles and be able to apply them when utilizing appropriate technology to solve problems, communicate, reason, connect ideas, create representations, and make decisions in the real world.

Mathematics competency is the capacity of students to define, use, and appreciate mathematics in a range of situations. It combines using scientific thinking with the use of

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mathematical ideas, techniques, facts, and tools to illustrate, explain, and predict occurrences.  
Several school improvement plans were built around an up-to-date guideline for the enhancement programs' methodology. But raising every student's achievement level requires more than that; it also entails creating an environment that supports their mental health and enhances educational development.

The Enhanced-Regional Unified Numeracy Test (E-RUNT) was administered to all learners at the beginning of the face-to-face classes to assess their mathematical skills in terms of the basic operations specifically in addition, subtraction, multiplication, and division. The test will allow the teacher to determine whether a learner is numerate or not, with no further analysis of the results.

In the light of the preceding concepts, the researcher considered it worthwhile to analyze the mathematical skills of Learners using E-RUNT, and knowing the specific learning gaps focusing on the four basic operations in order to provide an appropriate intervention program. For the attainment of these goals, the study was conducted.

## MATERIALS AND METHODS

### Research Methodology

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This chapter presents the research methods, research design, respondents of the study, sampling design, data gathering procedure, research instrument, data analysis and statistical tools that were used in analyzing and interpreting data in the study.

## Research Method

A mixed method type of research was utilized in the study. Descriptive analytical research design under the quantitative approach was used to analyze the results of the Enhanced-Regional Unified Numeracy Test (E-RUNT) to determine the level of Mathematical skills of the learners, while qualitative research design using In-depth interviews was used to identify the difficulties encountered in answering the test.

Descriptive method was used in the study. Descriptive method according to Fraenkel and Wallen (2007), is utilized to provide the most detailed and accurate description of a certain circumstance. The information acquired could help teachers be successful in teaching mathematics in the new normal by determining the intervention program.

## Research Design

The study used descriptive analytical qualitative research design to analyze the results of the Enhanced Regional Unified Numeracy Test (E-RUNT) to determine the Mathematical level of the learners including their learning gaps in four fundamental operations in Mathematics.

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The goal of the qualitative study approach is to more clearly illustrate the typical mistakes and challenges that students have when answering the E-RUNT. Furthermore, by using a qualitative approach, researchers can speak with respondents directly to learn about the errors that students make in the four fundamental procedures. By using tests and interview protocols, qualitative descriptive research was utilized to collect data directly from data sources. It is explained that the goal of the study is to gather data regarding the E-RUNT analyses of students' mathematical proficiency.

The method of utilizing recent and past data to find patterns and links is known as descriptive analytics, according to Harvard University (2023). Since it only describes relationships and trends without going deeper, it is frequently referred to as the most basic type of data analysis.

## Respondents of the Study

The respondents of the study were the 48 identified non-numerates from 100 learners in Grade 11.

In Grade 11 – Apollo, out of 37 learners, 23 are numerates and 14 are non-numerates which is 29 percent of the number of respondents of the study.

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Grade 11 – Hermes has an enrollment of 31 in which 15 are numerates and 16 are non-numerates. These 16 identified learners represent 33 percent of the total number of respondents of the study.

In Grade 11 – Zeus, out of the 32 total enrollment in the class, 14 of them are numerates while 18 are identified as non-numerates which is 38 percent of the total number of respondents.

The data are shown in Tables 1-A and 1-B.

### Table 1-A

*Distribution of Respondents in Grade 11 by Section in Calaya National High School, Schools Division of Guimaras*

| Section              | Number of Learners | %      |
|----------------------|--------------------|--------|
| 1. Grade 11 – Apollo | 37                 | 37.00  |
| 2. Grade 11 - Hermes | 31                 | 31.00  |
| 3. Grade 11 – Zeus   | 32                 | 32.00  |
| Total                | 100                | 100.00 |

### Table 1-B

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*Distribution of Non-Numerates Respondents in Grade 11 by Section in Calaya National*

*High School, Schools Division of Guimaras*

| Section              | Non-numerates | %      |
|----------------------|---------------|--------|
| 1. Grade 11 – Apollo | 14            | 29.00  |
| 2. Grade 11 - Hermes | 16            | 33.00  |
| 3. Grade 11 – Zeus   | 18            | 38.00  |
| Total                | 48            | 100.00 |

### Sampling Design

Purposive sampling design was utilized in the study. The purpose of the study and the characteristics of the population are taken into consideration when selecting this design. According to Palinkas et al. (2015), qualitative research typically uses purposeful sampling to identify and select examples that are full of information on the topic of interest. The terms judgmental, selective, or subjective sampling are other names for purposive sampling.

### Research Instrument

The research instrument used in the study is the Enhanced-Regional Unified Numeracy Test (E-RUNT). The results of the E-RUNT were analyzed and determined the

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Mathematical level of Grade 11 learners as a whole and in terms of their Mathematical level in Addition, Subtraction, Multiplication, and Division. Learning gaps will also be identified so that an intervention program can be proposed.

### Data-Gathering Procedures

The graduate school dean of the University of Iloilo gave the researcher permission before the study carried out. She then requested approval from the Calaya National High School's administration to perform the study with the learners in grade 11.

To ensure smooth retrieval and collection of the test results, the researcher additionally requested the cooperation and understanding of school head and respondents from the aforementioned school.

In order to guarantee the respondents' dignity, compliance with the research ethics process was also accomplished by signed informed permission.

The researcher personally conducted and started the distribution and administration of the Enhanced – Regional Unified Numeracy Test (E-RUNT) questionnaires to the respondents.

After obtaining the data on the results of (Enhanced – Regional Unified Numeracy Test (E-RUNT) the data was organized, computed, and tabulated and thematic analysis was also used in determining the difficulties encountered by the learners in answering E-RUNT.

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## Data Analyses

After the successful retrieval of the accomplished E-RUNT results, the data was organized, computed, and tabulated.

The following rating scale and description was used in the interpretation of the results.

| Scale         | Description |
|---------------|-------------|
| 36.01 – 40.00 | Very Good   |
| 30.01 – 36.00 | Good        |
| 20.01 – 30.00 | Average     |
| 10.01 – 20.00 | Poor        |
| 0.00 – 10.00  | Very Poor   |

The following rating scale and description was also used in the interpretation for Addition, Subtraction, Multiplication and Division.

| Scale        | Description |
|--------------|-------------|
| 9.01 - 10.00 | Very Good   |
| 7.51 - 9.00  | Good        |
| 5.01 - 7.50  | Average     |
| 2.51 - 5.00  | Poor        |
| 0.00 - 2.50  | Very Poor   |

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The Statistical Package for Social Sciences (SPSS) software was used on a computer to calculations, analyses, and interpretations.

Thematic analysis was also used in determining the difficulties encountered by the learners in answering E-RUNT. A qualitative data analysis technique called thematic analysis entails reading over a data collection and looking for pattern in the data's meaning (Braun & Clark, 2006).

### Statistical Tools

In the study, both descriptive and inferential statistics were employed. The frequency count, percentage, and mean were utilized in descriptive statistics. ANOVA and Post Hoc Test inferential statistics with 0.05 level of significance were employed in this investigation.

The information obtained regarding the grade 11 learners' E-RUNT scores was distributed normally.

The bell-shaped distribution is another name for the normal distribution. It shows a graph in which the data is grouped around the mean, progressively decreasing toward the tails, and having the maximum frequency in the middle. Data must be regularly distributed in order to be used in parametric statistical tests (Mcleod, 2023). Thus, the researcher used ANOVA and Post Hoc Test as a result.

**Frequency Count.** According to Santos (2006), frequency count provides a description of the respondents' profile in terms of the distribution of numbers for each chosen personal

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feature. This was done in order to determine how the responses were distributed within a specific category.

**Percentage.** According to Ruiz (2003), a percentage is the number obtained by dividing a measurement or value by the total values. This result is then multiplied by 100. This was done in order to determine the respondents' proportion within a certain group.

**Mean.** According to Borro (2002), the mean can be calculated by dividing the total weighted score of all the items on the checklist by the total number of items. The mean, which was derived from the E-RUNT findings, was used to determine the average scores that represent the learners' mathematical skills.

**ANOVA.** ANOVA is used to assess if the means of three or more independent groups differ in a way that is statistically significant (Bobbit, 2020). The ANOVA was employed to ascertain whether the division, multiplication, subtraction, and addition skills of learners utilizing E-RUNT differed significantly from one another.

**Post Hoc Test.** Post Hoc is an integral part of an ANOVA. In Latin post hoc means "after this". It is used to explore differences between multiple group means after a statistically significant test (Frost, 2023). The Post Hoc Test was used to determine the differences in the Mathematical skills of learners using E-RUNT when classified according to addition, subtraction, multiplication, and division.

## Results and Discussions

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The study was conducted to determine and analyze the mathematical skill level of learners using Enhanced Regional Unified Numeracy Test in Calaya National High School, Schools Division of Guimaras, Province of Guimaras.

The participants of the study are the grade 11 senior high school learners of Calaya National High School. Among the pool of learners, the forty-eight low performing scores were analyzed in terms of addition, subtraction, multiplication and division skills level.

Individual interviews were used on the qualitative aspect using face-to-face interactions to facilitate access and faster data gathering transactions. The study adopted a purposive sampling strategy and sought voluntary participation.

The research instrument used in the study was the E-RUNT and interview schedule to gather data. The latter was subjected to validity test by experts.

The data collected were processed, analyzed and interpreted with the descriptive and inferential part for quantitative aspect and interviews were transcribed manually and then analyzed thematically.

Based on the data presented, the following are the findings:

The level of mathematical skills of learners using E-Runt are Average.

The level of mathematical skills of learners in terms of Addition are Good.

The level of mathematical skills of learners in terms of Subtraction are Average.

The level of mathematical skills of learners in terms of Multiplication are Average.

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The mathematical skills of learners in terms of Division are Average.

There is a significant difference in addition, subtraction, multiplication, and division in mathematical skills of learners using E-RUNT.

The Common Errors of Learners in Addition centered on Understanding the Value of Signed Numbers.

The Common Errors of Learners in Subtraction focused on the theme Misled by the Signs.

The Common Errors of Learners in Multiplication was incomplete mastery of number facts.

The Common Errors of Learners in Division deals with getting entangled by the Integers and Word Problems.

The result of this study shows that the difficulties of Learners primarily centered on incomplete understanding of the language of Math and misconception of Mathematics as a subject.

Based on the data gathered, Mathdali' Intervention Program intervention program was developed with the hope of strengthening the remediation practices of the schools to make mathematics fun and significant to learners. This program covers the different strategies to be used by the teachers in conducting remedial classes focusing on the four basic operations and even higher mathematical operations.

## Insights

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In the conduct of the study, the researcher gained significant insights specifically on the value of mathematics in our everyday life. Learners need to master the basic operations such as addition, subtraction, multiplication and division in order to learn complex math topics.

Math is more than just about numbers (Thurston, 2017). These means that learning math needs understanding and have passion towards it. Mindset and passion towards mathematics can greatly develop level of mathematical skills among learners. Most of the learners have notion that Math is a difficult subject. This notion needs to be change especially those that identified as non-numerates learners. They will learn math step by step by the help of teachers, peers and parents anchored on Vygotsky scaffolding. They should be optimistic and open- minded for the possibilities to learn.

Teachers have a crucial rule in making math class interesting and engaging for learners. Learners should also take their part in order to learn. Learning math especially relating it in real life scenario make learners learn productively and meaningfully (Cetin, 2019).

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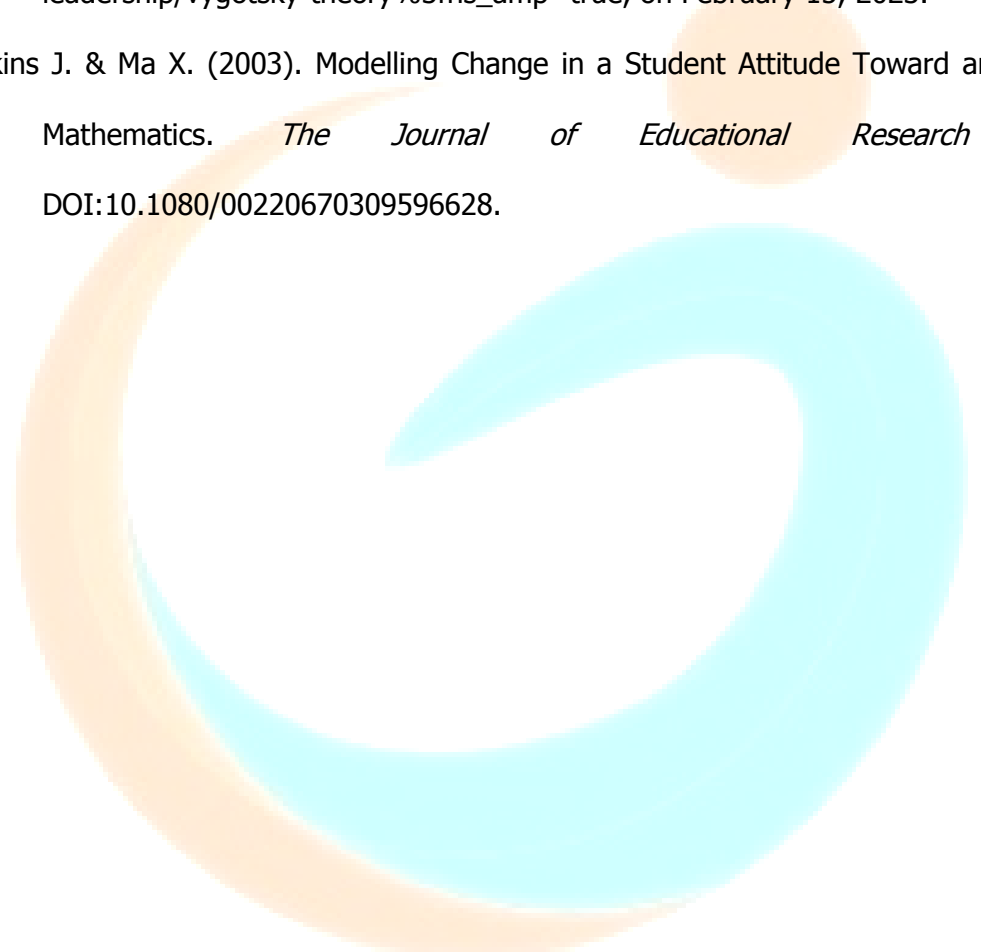


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