Project UNGARA: Understanding Numbers, Growing through Analysis, Reasoning, and Application as Intervention in Mathematics 5 in Arteche Central Elementary School

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DOI: https://doi.org/10.47772/IJRISS.2026.101000531

Received: 22 October 2026; Accepted: 27 October 2026; Published: 06 November 2026

ABSTRACT

The effectiveness of Project UNGARA, a mathematics intervention that aims to shift the method of teaching in mathematics from rote memorization towards conceptual understanding, critical thinking, and application of real-life situations among Grade 5 students at Arteche Central Elementary School was assessed in this action research during the School Year 2025-2026. Based on the MATATAG curriculum and Rapid Mathematics Assessment (RMA), this quasi-experimental research comprised the entire Grade 5 level with 112 students at the beginning of the school year and 107 students at the end of the school year as participants. Data were gathered by means of standardized RMA tools, implementation logs, proficiency tracking sheets, and interviews with students and teachers and analyzed via descriptive, comparative and thematic approaches. Results showed that 97% of students were at the Emerging level of learning at the beginning of the school year, and the achievement of proficiency level in Numbers and Algebra, Measurement and Geometry, and Applying and Reasoning domains was equal to zero. By the end of the school year, all students moved from the Not Proficient category, and 88% of them became Transitioning or At-Grade-Level in their performance. The highest improvements were reported in Numbers and Algebra (+88%) and Data and Probability (+67%), while the lowest performance was reported in Measurement and Geometry. At the same time, in the Knowing domain, 88% of learners achieved proficiency level, though the same results were achieved in the applying and reasoning categories, meaning that the overall performance in this competency domain was much lower than in other cognitive learning domains. A moderate gender gap was identified as well, with all students remaining on the Emerging level being males. It can be stated that the findings clearly show that aligned instruction, localized materials, formal assessments, and monitoring of peers can successfully contribute to achieving proficiency in mathematics. Nevertheless, there is a need for extra focus on the development of higher-order thinking skills and measurement competencies in regards to spatial reasoning capabilities.

Keywords: Project UNGARA, Mathematics Intervention, Rapid Mathematics Assessment (RMA), MATATAG Curriculum, Grade 5 mathematics proficiency, Conceptual Understanding, Eastern Samar.

BACKGROUND AND RATIONALE

Mathematics is vital as it is fundamental to the improvement of reasoning processes, analytical thinking, and problem-solving skills. The importance of learning mathematics cannot be overemphasized, because this discipline creates critical thinking as well as problem-solving abilities for solving problems in everyday life and in a number of professions. It enables people to think logically. Mathematics also plays an important role in the fields of science, technology, engineering, and economics. Moreover, mastering mathematical concepts develops analytical abilities essential for grasping data, spotting trends, and thinking abstractly in our data-driven world.

It is noted that multiple students have difficulty in learning their math courses as they require memorization and repetitive practices rather than the understanding of the concept. As a result, students might lose their interest in the subject, as a result of which their eagerness and determination to study mathematics diminish (Boaler, 2016).

Despite these challenges *Project UNGARA* remains committed to the Department of Education's mission of continuing education and cultivating a knowledgeable population amid the disruptions that it is dealing with. This initiative acknowledges the importance of mathematics in logical reasoning, problem-solving, and practical decision-making; thus, it emphasizes the necessity of teaching arithmetic to all children.

Mathematics is more than just rote learning and producing the right outcomes. It is about familiarity with notions, critical reasoning, problem solving, and knowledge application. The idea of Project UNGARA stems from the aforementioned as this program promotes the idea of learning to understand and think critically instead of just memorizing certain formulas and doing tasks repetitively. The name of the project itself reflects its principles *Understanding Numbers, Growing through Analysis, Reasoning, and Application.*

Education systems are therefore obliged not only to close the gap in students' proficiency but also to foster resilience and self-confidence in learning. Project UNGARA defines a new approach to the achievement in mathematics success in mathematics is not measured by speed or high scores in math, but by the ability to understand to ask questions, to analyze and use numbers for improvement of the world around.

Researchers have noticed a lack of instructional resources that can support learning like modules, activity guides, and skills textbooks. Accordingly, this action research was aimed at improving students' basic math skills through the use of the Rapid Mathematics Assessment (RMA).

LITERACY REVIEW

The globalization of economy, multicultural populations, and rapid technological development give birth to a number of challenges for educational systems. Education has been historically the area of many reform efforts aimed to meet the needs of the constantly changing society in the past. Huge reform efforts were undertaken in the United States to narrow the gap between various subgroups in the United States and between the U.S. and other countries (Zhao, 2009). Despite these efforts still being numerous, education systems are facing problems with meeting the needs of 21-century learners and employers. Realizing the importance of this issue, the educational establishments ought to undergo substantial restructuring. The term "21st Century" cause the educators and statutory officials to search for the ways to make sure that the students are prepared for life, with education systems developing faster than ever.

During the early stages of the educational process, instructors have the responsibility of creating a productive mathematical environment to help learners become economically effective members of society. The need for mathematical skills has become increasingly apparent in recent years. Learners who have high levels of mathematical skills have a competitive advantage in terms of their performance in school and finding work. As a result, first grade is a very important time in the process of learning mathematics. Success at this stage makes it easier for learners to move on to higher levels of high school mathematics and sciences, which are prerequisites for university education and success in the work environment (Madayag, 2011).

Teaching Mathematics skills is crucial in the MATATAG Curriculum functioning as the cornerstone of logical reasoning, problem-solving, and being an essential part of lifelong learning. The Rapid Mathematics Assessment (RMA), introduced by the Department of Education (DepEd), is an assessment tool that is used at the Beginning-of-School-Year (BoSY) and End-of-School-Year (EoSY) to assess students' performance in respective content areas (Numbers and Algebra, Measurement, and Geometry, Data and Probability) and cognitive fields (Knowing, Applying, and Reasoning).

Similarly, Salandanan (2001) pointed out how learning materials are the best way for the teacher to guide students as they learn. A teacher who has had professional training and is knowledgeable of educational facts and goals may still have difficulties in carrying out the lessons without using the proper materials. On the other hand, Rivera (2011) indicated that mathematics follows the principle that it needs to be done to be learned. Due to the nature of learning mathematics, where one must grasp concepts in order to deal with abstractions, mathematics instructors must make the instructions practical so as to help students see concepts. It is when students work with a lot of different hands-on materials that they are able to learn abstract principles and ideas from the instances they study.

In a similar vein, Robert Slavin stated that learners should perform practice activities to convert new knowledge into long term memory and link new knowledge with previous ideas. Practice work may originate from books, workbooks, instructional materials, and trainer's work as well. However, practically speaking, practice can be beneficial for learners if it is limited in time (Manzano, 2004). Studies demonstrate the import-

ance of the materials used in educational process, as they make a considerable contribution in improving effectiveness of the learning process. Various researches have proven that the use of such materials reduces the latter weaknesses of studens in mathematics and raises their poor performance.

Statement of the Problem

The research investigates the increase in math skills of fifth-grade students, as identified in Arteche Central Elementary School from the beginning of the school year until its end, and determines the reasons for this increase. More specifically, the study attempts to answer these questions:

What was the mathematics proficiency for Grade 5 learners at the Beginning of Year (BoSY) and End of Year (EoSY) in relation to:

Overall proficiency levels?

Performance in the different content domains?

Performance in different cognitive domains?

Was there a significant difference in proficiency levels found between the two periods?

What were the intervention measures taken in the school and instruction that probably accounted for the observed change?

What challenges remain in attaining full proficiency of grade level achievement level?

What type of evidence-based action plan can be developed to further improve mathematics proficiency?

Research Objectives

This research aims to evaluate the efficacy of Project UNGARA as a mathematics intervention for Grade 5 learners, focusing on the following objectives.

1. Describe the baseline (BoSY) and end line (EoSY) math proficiency of fifth-grade students of Arteche Central Elementary School.
2. Perform a comparison of the distribution of proficiency rates over time across the various content domains and cognitive domains.
3. Record and validate the implemented interventions.
4. Identify existing gaps in mathematics instruction and challenges that remain.
5. Develop a sustainable intervention framework based on the data available that fits the MATATAG curriculum.

Significance of the Study

For Teachers: Supplies practical proof of the useful methods to be improved and areas to enhance teaching.

For Schools: Provides information on the distribution of resources, the key areas for teachers' development, and the planning of improvements in schools.

For Students: Provides information about students who require support for enhancing their skills.

For SDO Eastern Samar: Contributes to the overall information on the effectiveness of different RMA-based methods of support.

For Future Scholars: It will be the point of reference for long-term studies with the use of RMA as a measurement tool.

METHODOLOGY

Research Design

In this study, the participants were all Grade 5 students of Arteche Central Elementary School for the 2025-2026 School Year, entailing all learners in the cohort. This study used a quantitative method through a quasi-experimental design involving Rapid Mathematics Assessment as part of Beginning of School Year (BoSY) and End of School Year (EoSY) assessments to determine if there were changes in the whole group's performance after the application of Project UNGARA.

Instrumentation

This study utilized two primary standardized assessment tools and supplementary document review instruments to gather data on Grade 5 learners' mathematics proficiency.

Department of Education (DepEd) Bureau of Curriculum Development is aligned with the MATATAG Curriculum Key Stage 2 Mathematics learning competencies that provides baseline information to measure the starting proficiency of the Grade 5 students at the beginning of 2025 2026 School Year, the content domains where numbers and algebra, measurement and geometry while the data and probability cognitive domains are knowing, applying and reasoning.

Table 1: Supplementary Data Collection Instruments

Instrument	Purpose
Learner Proficiency Tracking Sheet	The compilation of aggregated and anonymized proficiency levels segregated by both gender and assessment period based on the official institution summary reports provided by RMA .
Intervention Implementation Log	Research tool applied to cross-check teaching methodology used, remediation conducted, material used to teach and peer tutoring programs used.
Teacher Practice Interview Guide	Use of semi-structured questions used to confirm what interventions were used constantly and what factors were perceived to facilitate or block the increase in achievements.

The standardized pretest and posttest of Rapid Mathematics Assessment (RMA), this study used a variety of additional tools with the aim to obtain in-depth and varied data regarding the implementation, outcomes, and experience of Project UNGARA. Such tools were aimed to supplement numerical achievement scores with qualitative information about the ways in which the intervention affected specific aspects of learners' understanding of mathematics, confidence, and engagement.

Data Quality Control

The official DepEd RMA School Summary Forms, which were signed by the Head of the School and the Division Testing Coordinator, were used to confirm all of the assessment results. Double data entry was also done to make sure that there were no mistakes in entering any information. No personal identifiers like, names and learner numbers, were part of the analysis to keep the results private. The materials and results are kept in the relevant Research and Testing Office of the school for auditing and verification.

Table 2: Data Analysis Plan

Analysis Type	Purpose
Descriptive Statistics	Frequencies, percentages, and proportions to describe proficiency distributions
Comparative Analysis	Percentage point change and relative growth between BoSY and EoSY
Thematic Analysis	Coding of interventions and challenges from logs and interviews
Gap Analysis	Identification of persistent low-performing domains and learner subgroups

Ethical Considerations

All data handled with utmost confidentiality, all data presented as aggregate with no possibility of individual identification. Written consent given by school head and advocates. Results shared for school improvement and DepEd report purposes.

RESULTS

This section presents the proficiency levels and performance outcomes of Grade 5 learners before and after the implementation of Project UNGARA. Data are drawn from the Beginning-of-School Year (BoSY) and End-of-School Year (EoSY) Rapid Mathematics Assessment, showing changes in overall proficiency, content domain mastery, and cognitive skill development.

Proficiency Levels: BoSY vs. EoSY

Table 3: Distribution of Learners by Proficiency Level

Proficiency Level	BoSY (n=112)	%	EoSY (n=107)	%	%-Point Change
Emerging (Not Proficient)	46	41%	0	0%	−41%
Emerging (Low Proficient)	63	56%	2	2%	−54%
Developing (Nearly Proficient)	3	3%	11	10%	7%
Transitioning (Proficient)	0	0%	78	73%	73%
At Grade Level (Highly Proficient)	0	0%	16	15%	15%
Total	**112**	**100%**	**107**	**100%**	—

BoSY showed near-universal Emerging status (97%). By EoSY, 88% reached Transitioning or higher; only 2% remained at Low Proficient.

Performance by Content Domain

Table 4: Content Domain Performance Summary

Content Domain	BoSY Mastery	EoSY Mastery	Change
Numbers and Algebra	0%	88%	88%
Measurement and Geometry	0%	15%	15%
Data and Probability	21%	88%	67%

Numbers & Algebra and Data & Probability showed the largest absolute gains. Measurement & Geometry improved but remains the lowest-performing domain at EoSY.

Performance by Cognitive Domain

Table 5: Cognitive Domain Performance Summary

Cognitive Domain	BoSY Mastery	EoSY Mastery	Change
Knowing	1%	88%	87%
Applying	0%	15%	15%
Reasoning	0%	15%	15%

Knowing (recall/comprehension) achieved near-universal mastery. Applying and Reasoning (higher-order skills) advanced from zero but remain disproportionately low.

Gender Disaggregation

Table 6: Proficiency by Sex at EoSY

Group	Emerging	Developing	Transitioning	At Grade Level
Male (n=53)	2	11	35	5
Female (n=62)	0	0	43	11

Females show no Emerging-level learners and higher representation in at Grade Level. Males account for all remaining Emerging cases and a larger share of Developing learners.

DISCUSSIONS

Interpretation of Key Findings

The almost complete change from Emerging to Transitioning level of proficiency shows how successful the school year interventions were in developing basic knowledge. The fact that 88% of grade 5 students mastered the concept of Knowing depicts how well students have grasped basic concepts that MATATAG considers essential.

Differences across different domains show that growth was uneven:

Numbers & Algebra is most directly addressed through daily instruction, drill practice, and localized learning materials.

Measurement & Geometry and Reasoning require more abstract visualization, multi-step problem-solving, and real-world application skills that take longer to develop and may have received less focused instructional time.

The gender gap in advanced proficiency may reflect differences in instructional engagement, confidence-building, or out-of-school support systems.

Implication to Instruction and Policy

Daily formative assessments, peer tutoring and well-aligned instructional materials played a vital role in the gains made. Time should be dedicated to teaching Measurement and Geometry and Reasoning strategy. Specific measures are needed to support boys so that they do not fall back at this point.

Table 6: Proposed Action Plan

Priority Area	Activities	Timeline	Responsible

Strengthen Measurement & Geometry Competency	Use localized/indigenous measuring tools; weekly geometry challenge tasks	Q1–Q2	Grade 5 Math Teachers
Boost Reasoning Skills	Explicit teaching of problem-solving steps; "Explain Your Answer" routines	Q1–Q4	Math Teachers
Targeted Remediation	Small-group tutoring for 13 learners below Transitioning; peer mentoring	Ongoing	Teachers & Student Leaders
Gender-Responsive Pedagogy	Encourage equal participation; confidence-building activities; inclusive problem contexts	Q1–Q4	All Teachers
Monitoring & Evaluation	Quarterly mini-assessments aligned with RMA; progress tracking dashboards	Quarterly	School Head & Teachers

LIMITATIONS OF THE STUDY

Single school, single cohort results generalizability limited. Intervention effects inferred from documented practices; controlled comparison not possible and some data (home environment, attendance) not included in the analysis.

CONCLUSION

During the 2025–2026 RMA, BoSY results reflect that student at Arteche Central Elementary School experienced a significant performance gap, especially in Grade 5, as 97% of learners remained at the Emerging proficiency level, along with 41% not being proficient and 56% being low proficient. 0% of students achieved Transitioning (Proficient) or At Grade Level (Highly Proficient) The performance across all cognitive domains remained poor, as in the case of Reasoning, where no mastery has been gained.

By EoSY, substantial growth was observed 73% Transitioning (Proficient) 15% At Grade Level (Highly Proficient) Emerging levels dropped to 0% Not Proficient, 2% Low Proficient Developing rose to 10%.

The exceptional advancement in mathematics of fifth grade pupils of Arteche Central Elementary school in terms of progress for their school year has shown the working condition of instructional strategies put into practice during that academic year. Nevertheless, although learning is concentrated mainly on basic skills, higher-level thinking and geometry can still be developed further. In order to maintain the progress achieved, the focus should now be put not on acquiring knowledge but rather on applying it in practice, with appropriate measures taken concerning those areas and groups that lag behind.

Project UNGARA has shown to be an effective math strategy that changed the performance scheme of the Fifth-Grade students in Arteche Central Elementary School. By defining the math subject not as simple memorization of the formula or as finding the right answers, but as the knowledge of the concept, thinking critically, solving problems, and practicing knowledge in real life, it has achieved great results: Totally eliminated the Not Proficient Group and, by the end of the academic year, 88% of students reached Transitioning and At Grade Level proficiency. Although there were substantial improvements in Foundational Knowledge, high-order skills in Applying and Reasoning are still being at the emergent level.

The results have shown that when a certain emphasis on understanding and practical applicability of information is made in the course of teaching, this leads to positive results and facts in learning.

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