

Research Article

Project RARE (Recall and Relearn) It's Effect on the Mathematics Performance of Selected Grade11 HUMSS Students

Arianne Rae Caguitla Lucero*

Department of Education Region IV-A, Schools Division Office of Cavite Province, Tanza National Comprehensive High School, Tanza, Republic of the Philippines

Abstract

This study focused on the effect of Project RARE (Recall and Relearn in improving the performance in General Mathematics of selected Grade11 HUMSS students of Tanza National Comprehensive High School during First Quarter period of the school year 2022-2023. This study is a one-group pre-test and post-test design. Mean, mean percentage score, standard deviation and paired sample t-test were used to determine the effectiveness of Project RARE (Recall and Relearn) in improving the performance in General Mathematics of the students. The study revealed the mean score of pre-test is 13.78 while post-test is 20.63 which increased by 6.5 and can be concluded that Project RARE improved the mathematics performance of the students in the first quarter. The computed t-value of -8.59 is at left of the critical t-value of ± 2.01 at 5 percent level of significance with 45 degrees of freedom, indicates that there is a significant difference between the pre-test and the post-test results of the subjects of the study. This study was limited to the effects of the Project RARE (Recall And Relearn) in improving the performance of selected Grade11 HUMSS students of Tanza National Comprehensive High School in General Mathematics focusing on the prerequisite skills specifically, Operations on Integers and Operations on Polynomials needed for the First Quarter period of SY 2022-2023. This study reveals that Project RARE (Recall and Relearn) is a new and successful intervention program in recalling and relearning prerequisite skills needed particularly in General Mathematics.

Keywords

Prerequisite Skills, Recall, Relearn, Intervention Program

1. Introduction

Human intellect and logic are fundamentally based in Mathematics, which is also essential to our efforts to understand the outside world and ourselves. Mathematics promotes logical thinking and mental rigor and is a useful method for developing mental discipline [1]. Mathematical knowledge plays a very important role in understanding contents as this

must be applied to other subjects related to science, engineering, social sciences, accounting and even music and arts [2]. Math also plays a crucial role in solving problems and execution of daily tasks.

COVID-19 pandemic had brought upon many challenges in many sectors especially in the education system [3]. It altered

*Corresponding author: ariannerae.lucero@deped.gov.ph (Arianne Rae Caguitla Lucero)

Received: 14 September 2024; Accepted: 4 November 2024; Published: 17 February 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

the way that teaching, and learning are carried out. To ensure learning continuity, schools and other educational institutions temporarily shifted to online distance learning [4]. The Department of Education introduced the Basic Education Learning Continuity Plan during this time [5]. This was a response to the challenges caused by COVID-19 in basic education. Due to the decreased amount of contact time for students and the lack of teacher advice when encountering learning/understanding challenges, the level of academic performance of the students especially in Mathematics subjects is expected to decline for the classes held for both the summative assessment and end-of-semester examinations [6].

The proponent of this research devised a plan to help learners taking the Humanities and Social Sciences Strand to Recall and Relearn crucial pre-requisite skills in General Mathematics. Project RARE generally aims to recall important topics in subject areas already taken in Junior High School to achieve mastery and for students to easily comprehend new topics introduced in General Mathematics.

1.1. Action Research Questions

This study aims to determine the effectiveness of Project RARE (Recall and Relearn) in improving performance in General Mathematics of selected Grade 11 students of Humanities and Social Sciences in facing new normal education.

Specifically, this study seeks to answer the following questions:

- 1) What is the performance of selected Grade 11 students of Humanities and Social Sciences in General Mathematics before and after the implementation of the intervention?
- 2) Is there any significant difference between the pre-test and post-test results of the subjects of the study?

1.2. Hypothesis

There is no significant differences between the pre-test and post-test results of the subjects of the study.

1.3. Proposed Innovation, Intervention and Strategy

Recall and Relearn Project, also known as Project RARE, is an intervention program that gives opportunity to the students to recall and relearn the prerequisite skills and recover some of the learning losses brought on by distance learning under the Modular and Online Modality during Junior High School periods. Because it is a skill-based subject, mathematics calls for the use of prerequisite skills. The acknowledgement of prerequisite skills is important for students so they can understand what needs to be understood to be successful in a new mathematics course [7]. Since mathematics may be applied to other subjects like science and engineering, these prerequisite skills are necessary.

To achieve lifelong learning, Project RARE focuses on reteaching the pre-requisite math skills. Students will find it easy to comprehend and apply these prerequisite skills in other areas of mathematics with the aid of this intervention program. Additionally, it will ease the strain that comes with teaching higher mathematics to teachers. This program will assist both students and teachers in their ongoing struggle in mathematics.

To track each student's growth and changes more effectively, the Project RARE will be run for several months specifically on the first quarter. This will be incorporated into the routine activity. Each prerequisite skill will be given a month's worth of time, or more depending on how well the students perform, to ensure mastery. The diagnostic test will be given by the teacher utilizing a CBEA-based exam during the first week of class. The entire class will recall and relearn the lesson on operations on integers and operations involving polynomials in the remaining week of the first quarter of the online and face-to-face learning modality.

Furthermore, the Recall And Relearn Project (RARE) aims the following:

- 1) Increase mathematics performance of Grade 11 students in General Mathematics with the use of the intervention program.
- 2) Apply an effective strategies and useful techniques on the pre-requisite skill in General Mathematics.
- 3) Highlight the importance of pre-requisite skills in mathematics in learning General Mathematics.
- 4) Develop an Intervention Plan that can be a learning tool in General Mathematics in facing new normal education.

2. Action Research Methods

This study is quantitative research specifically a one-group pre-test and post-test design. It will test the effectiveness of Project RARE (Recall And Relearn) Intervention Plan in the performance of selected Grade 11 students of Humanities and Social Sciences in General Mathematics.

2.1. Participants and/or Other Sources of Data and Information

The participants of the study are selected Grade 11 students of Humanities and Social Sciences of Tanza National Comprehensive High School. Furthermore, there is no sampling technique to be used in the study since the subject of the study are students from one section handled by the teacher-researcher. Since there are 46 students in HUMSS 11- Socrates, then the total number of participants of the study is 46.

2.2. Data Gathering Methods

2.2.1. Pre-Experimental Phase

On this stage, the researcher prepared the instruments to be

used in the study using the CBEA type of assessment from the Division Office. The instruments focused on the most essential learning competencies in General Mathematics subject.

CBEA Test (Pre-Test)

The researcher used CBEA type of assessment from the Division of Cavite province for the pre-test and post-test.

Project RARE Intervention Plan

The researcher asked mathematics experts such as master teachers for the validation of the Project RARE Intervention Plan.

Instrument Testing

The pre-test and post-test underwent reliability testing. The validated instrument Pre-Test and/ or Post-test was tested to measure the reliability of the examinations. (DM No. 238 s. 2022 – Conduct of the Cavite Basic education Assessment (CBEA)).

2.2.2. Experimental Phase

On this stage, the researcher administered the Pre-Test on the first week and implemented the Project RARE Intervention Plan (Recall and Relearn) on the second week in teaching General Mathematics among the selected students of Grade 11 Humanities and Social Sciences Strand students. This will be done on the first grading period of the school year 2022-2023.

2.2.3. Post Experimental Phase

On this stage, the subjects of the study were given the post assessment test. The examination is just the same with the pre-test and the Test questions were jumbled.

2.3. Data Analysis Plan

In analyzing the research questions of the action research, mean, mean percentage score standard deviation and paired sample t-test were used, and it was statistically calculated using IBM SPSS version 20.

2.4. Ethical Issues

In this study, the researcher ensured the confidentiality of all the data gathered. Moreover, no monetary involvement on

the part of the participants and school. The researcher guaranteed that the facilitation of Project RARE did not cause any emotional distress among the subject of the study.

3. Results and Discussion

1. What is the performance of selected Grade 11 students of Humanities and Social Sciences in General Mathematics before and after the implementation of the intervention?

Table 1. Pre-Test and Post-Test Result of the Subjects Study.

	Pre-Test	Post-Test
Number of Observation	46	46
Number of Items	30	30
Mean	13.78	20.63
MPS	45.93	68.77
Standard Deviation	3.65	3.99

Table 1 shows the pre-test and post-test of the subjects of the study. Out of 30 items pre-test, the mean score of the subjects of the study is 13.78 with standard deviation of 3.65 and mean percentage score of 45.93. The subjects of the study are not familiar with the first quarter most essential learning competencies in General Mathematics. On the other hand, post-test result shows a mean score of 20.63 with standard deviation of 3.99 and mean percentage score of 68.77. It implies that the performance of the subjects of the study increased by 6.5. Thus, it can be concluded that Project RARE improved the mathematics performance of the students in the first quarter.

2. Is there any significant difference between the pre-test and post -test results of the subjects of the study?

Table 2. Difference between the pre-test and post-test results of the subjects of the study.

N	df	α	p-value	Computed t-value	Critical t-value	Decision	Interpretation
46	45	0.05	<.00001	-8.59	± 2.01	Reject HO	Significant

The table shows the difference between the pre-test and post-test results of the subjects of the study. In as much as the computed t-value of -8.59 is at left of the critical t-value of ± 2.01 at 5 percent level of significance with 45 degrees of freedom, the null hypothesis is rejected. This indicates that

there is a significant difference between the pre-test and the post-test results of the subjects of the study. The main objective of an intervention program is to help students become more successful mathematics learners by building their understanding of essential content as well as their motivation

and confidence [8]. Impliedly, Project RARE is an effective intervention program to the subjects of the study and has a

significant effect on the mathematics performance of the students.

Action Plan

Table 3. Project RARE (Recall And Relearn) Intervention Program Action Plan.

OBJECTIVES	STRATEGIES	TIME-FRAME	RESOURCE / PERSON INVOLVED	EXPECTED OUTCOME
KRA 3: DIVERSITY OF LEARNERS, CURRICULUM AND PLANNING, & ASSESSMENT AND REPORTING				
1) To recall and relearn prerequisite skills needed for the First Quarter in General Mathematics	1) August 22, 2022 – November 5, 2022 2) Week 1: Administering the Pre-Test using CBEA type of Assessment 3) Week 2: Start of the Recall and Relearn Activity. This Activity will be incorporated into the routinary activity. (5 mins) 4) Topic: Addition of Integers 5) Week 3: Subtraction of Integers 6) Week 4: Multiplication of Integers 7) Week 5: Division of Integers	First Quarter of S. Y. 2022-2023	Students, Teacher	1) Students will be able to recall and relearn the prerequisite skills needed for the First Quarter in General Mathematics
2) To increase the mathematics performance of the students for the First Quarter.	8) Week 6: Addition of Polynomials 9) Week 7: Subtraction of Polynomials 10) Week 8: Multiplication of Polynomials 11) Week 9: Division of Polynomials 12) Week 10: Administering the Post-Test using CBEA type of Assessment. Test items were jumbled.			

Table 4. Dissemination of Activities.

DISSEMINATION ACTIVITIES <i>add rows if necessary</i>	No- vember	De- cember	Jan- uary	February	March	April	May	June	July
1. Share the study to the STEM-Mathematics Teachers through FGD									
2. Share study to all STEM teacher (Science Teachers) through LAC Sessions									
3. Share the study to all SHS teachers through Roll-Out Seminars									
4. Share the study to JHS Teacher through School-Based Seminar-Workshops									

4. Conclusion

For both students and teachers, the period of transition from online learning to face-to-face instruction is another challenge [9]. Intervention programs are required to address the issues that students and teachers are having when teaching mathematics [10]. According to the study, Project RARE (Recall and Relearn)

is a successful intervention program to address learning gaps in mathematics, focusing on recalling and relearning prerequisite skills needed particularly in General Mathematics. Additionally, it helps in improving students’ academic performance.

5. Recommendation

Since the study reveals the effectiveness of the intervention

program during the first quarter period, therefore Project RARE (Recall and Relearn) can be continued until the end of the school year and recommended to other General Mathematics Teachers of Tanza National Comprehensive High School and possibly to all subject areas focusing on the pre-requisite skills needed by the students.

Abbreviations

RARE	Recall and Relearn
HUMSS	Humanities and Social Sciences
COVID-19	Coronavirus Disease 2019
CBEA	Cavite Basic Education Assessment

Acknowledgments

First and foremost, I want to give thanks and praise to the Almighty God for guiding me through my research and pouring out His blessings so that I could complete it.

I would like to convey my profound gratitude to Mr. Norman C. Barosso, the head of my subject group, for allowing me the opportunity to do research and for his helpful guidance. His inspiration and direction have profoundly moved me.

I am grateful to my mum for her love and support throughout my entire teaching profession and journey. My spouse and daughter's love, compassion, and support helped me finish this study project, and I am very appreciative of them. I also like to thank my former colleague, Engr. Tim V. Cruz for lending a hand during my research. My gratitude is especially extended to the STEM Family for their words of support and encouragement that helped me complete my study.

Author Contributions

Arianne Rae Caguitla Lucero is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

References

- [1] Siegler, R. S., & Ramani, G. B. (2008). Playing linear numerical board games promotes low - income children's numerical development. *Developmental Science*. 2008, 11(5), 655–661. Retrieved from <https://doi.org/10.1111/j.1467-7687.2008.00714.x>
- [2] Brocardo, J. (2008). International commission on mathematical instruction. Retrieved November 24, 2022, from <https://www.mathunion.org/icmi/role-mathematics-overall-curriculum>
- [3] UNESCO (2020). COVID-19 Educational Disruption and Response. Retrieved from <https://doi.org/10.1007/s11125-020-09524-5>
- [4] World Bank. (2021). The impact of COVID-19 on education: Recommendations and opportunities for Ukraine. Retrieved from <https://doi.org/10.1596/978-1-4648-1768-4>
- [5] Llego, M., & Tilos, E. (2022, July 23). Download: Deped basic education learning continuity plan in the time of covid-19. Retrieved November 24, 2022, from <https://www.teacherph.com/download-deped-basic-education-learning-continuity-plan-in-the-time-of-covid-19/>
- [6] Engzell, P., Frey, A., & Verhagen, M. D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences*, 118(17), e2022376118. <https://doi.org/10.1073/pnas.2022376118>
- [7] Patey, N. (2021, September 14). Prerequisites in mathematics. Retrieved November 24, 2022, from <https://achievethecore.org/peersandpedagogy/prerequisites-in-mathematics/#:~:text=The%20acknowledgement%20of%20prerequisite%20concepts,in%20a%20new%20mathematics%20course>
- [8] Brodesky, A., E. F., & MacVicar, T. (2021, February). Strengthen mathematics intervention to promote student success: Suggestions for middle level principals. Retrieved November 25, 2022, from <http://www.cadrek12.org/resources/strengthen-mathematics-intervention-promote-student-success-suggestions-middle-level>
- [9] Dennen, V. P., et al. (2022). Challenges and instructor strategies for transitioning to online learning. *Frontiers in Communication*. <https://doi.org/10.3389/fcomm.2023.1260421>
- [10] National Center on Intensive Intervention. (2016). Principles for designing intervention in mathematics. Washington, DC: Office of Special Education, U.S. Department of Education. Retrieved from https://intensiveintervention.org/sites/default/files/Princip_Effect_Math_508.pdf