ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Enhancing the Numeracy Skills of Sta. Anastacia Elementary School Learners Through Project Math-Galing

Jobel A. Gonzales
Sta. Anastacia Elementary School, Philippines
Corresponding Author email: *jobel.acob@deped.gov.ph*

Received: 08 July 2024 **Revised**: 11 August 2024 **Accepted**: 14 August 2024

Available Online: 17 August 2024

Volume III (2024), Issue 3, P-ISSN – 2984-7567; E-ISSN - 2945-3577

Abstract

Aim: This action research aimed to enhance the numeracy skills of Grades 1-6 learners by 0% non-numerates using effective numeracy intervention. The researcher used Project Math-GALING (Guided Activities in Learning Innovation in Numeracy Goals) as an intervention teaching strategy to help Sta. Anastacia Elementary School (SAES) learners bridge the numeracy gap and master the four fundamental operations.

Methodology: A quantitative research methodology employing a descriptive approach was conducted at Sta. Anastacia Elementary School during the school year 2022-2023. This approach involved drills and practice and weekly assessments that track the learners' numeracy level. The study encompassed 1,416 students from grades 1 to 6, utilizing total population sampling to enable real-time result acquisition. Pre- and post-assessments were administered, and subsequently, the gathered data underwent classification, organization, and tabulation for comprehensive analysis.

Results: The findings revealed that Project Math -GALING enhanced the numeracy skills of Grade 1-6 learners by 0% non-numerates.

Conclusion: The data showed significant differences between the learners' performance before and after Project Math GALING. The results also evidently validated the claim that learners exposed to Project Math-GALING learners get more comfortable with mastering the four basic operations according to their interests and learning preferences. Moreover, they would also grow more confident in their ability to study Mathematics.

Keywords: *assessment, drills, enhance, intervention, non-numerate, numeracy*

INTRODUCTION

In response to the significant disruptions caused by the COVID-19 pandemic, the Department of Education (DepEd) of the Philippines has made a pivotal move to welcome learners back to in-person classes for the first time in two years, as per DepEd Order No. 034, s. 2022. This transition is part of DepEd's Learning Recovery and Continuity Plan (LRCP), which aims to ensure the effective implementation of the K to 12 curriculum despite ongoing challenges. The LRCP focuses on three key areas: learning remediation and intervention, socio-emotional functioning and mental health, and professional development for teachers. Among the priorities is the improvement of literacy and numeracy programs, with an emphasis on integrating 'peace competencies' to make the K to 12 curriculum more relevant and to produce job-ready, active, and responsible citizens. Vice President and Secretary of Education Sara Z. Duterte has emphasized the revitalization of Reading, Science and Technology, and Mathematics programs as part of the MATATAG: Bansang Makabata, Batang Makabansa agenda.

Mathematics, being a fundamental part of the school curriculum and a crucial building block for a wide range of skills and knowledge, requires particular attention. Elementary education focuses on teaching the four fundamental operations, which are essential for developing a comprehensive understanding of numbers and their applications in daily life. Numeracy, a key competency, involves identifying numbers confidently, counting, recognizing numbers, performing simple operations, and solving problems, which are necessary for grasping more

ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

complex mathematical concepts. Mastery of these basics is vital for students' academic progression and is a primary focus for teachers, alongside literacy, due to their critical importance highlighted by the Department of Education in the Philippines (Pitogo & Oco, 2023). Educators are aware that many factors, some outside of their immediate control, can impact student achievement. Last school year was particularly challenging in this regard. Schools across the country grappled with widening learning gaps as a result of the pandemic, with students affected by systemic and structural inequities bearing the brunt of the problem. Such gaps inevitably led to a sense of urgency among educators and an instinct to take immediate action, as was the case in my own school. Educators may feel compelled to make decisions that can lead to abandoning their original academic goals and aggressively addressing learning gaps through intensive remediation (Narayan, 2022). But we need to keep in mind that, while the urgency around learning gaps may be heightened right now, this problem is not entirely new. Therefore, we must ensure that our solutions aren't shortsighted. Overuse of academic-remediation interventions may offer temporary gains but impede long-term progress and ultimately lead to regression. (Smith, 2023)

However, Mathematics is often perceived as one of the most challenging subjects by students. Numerous studies have documented the prevalence of learning difficulties in mathematics. The COVID-19 pandemic has exacerbated these issues, widening the learning gap and leading to significant declines in math proficiency among young learners (Sooknanan & Seemungal, 2023). The pandemic has resulted in learning losses and knowledge gaps, particularly in mathematics, presenting both challenges and opportunities for educational reflection, innovation, and enhancement (Hobson, 2022). As students return to face-to-face instruction, there is an urgent need for effective intervention strategies to address these gaps and help learners achieve their educational goals.

To address this issue, Sta. Anastacia Elementary School has implemented Project Math-GALING (Guided Activities in Learning Innovation in Numeracy Goals). This intervention strategy aims to enhance the numeracy skills of Grade 1-6 learners, with the goal of achieving 0% non-numerates. The project employs drills, practice sessions, and weekly assessments to monitor and improve students' numeracy levels. Drill and practice, defined as systematic repetition of concepts and practice problems, promote the acquisition of knowledge or skills through disciplined exercises and rehearsals. While this method relies on repetition and rote learning, it is designed to build foundational skills necessary for more meaningful learning and problem-solving (Lim et al., 2012). By integrating Project Math-GALING into routine classes, the school aims to make students more comfortable and confident in mastering the four basic operations, thereby improving their overall mathematical proficiency.

Objectives

The general aim of this research is to enhance the numeracy skills of Grade 1-6 learners of Sta. Anastacia Elementary School by 0% non-numerates through Project Math-GALING

Specifically, the researcher sought to answer the following questions:

1. What is the numeracy level of Grades 1-6 learners before implementing Project Math-GALING?
2. What is the numeracy level of Grades 1-6 after implementing Project Math-GALING?
3. Is there a significant difference between the pre-test and post-test performance of the Grades 1-6 learners in Math-GALING intervention?

Hypothesis

Given the stated research problem, the following hypothesis is tested on 0.05 level of significance:

There is significant difference between the pre-test and post-test performance of the Grades 1-6 learners in Math-GALING intervention

METHODS

Research Design

This action research used quantitative method of research. It involves the use of computational, statistical, and mathematical tools to derive results. It specifically utilized descriptive method in the completion of this study.

ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Population and Sampling

Total population sampling is used in this study. It is a type of purposive sampling technique where you examine the entire population (i.e., the total population) with a particular set of characteristics. It can produce results that are available in real-time thus, considering everyone as the target respondents of the study. These also serve as the reasons why most instructors and research paper advisers prefer to have this type of sample in conducting a study.

Instrument

Division Unified Assessment Tool was used in finding the results of the study. Individual Results are categorized as Above Numerates (76%-100%), Numerates (51%-75%), Emergent (26%-50%), and Non-numerates (0%-25%).

Data Collection

The data were gathered, read, and analyzed following the objective of the study and in adherence to all protocols in the conduct of research.

Treatment of Data

The method of research used in this study is a paired sample t-test. The paired sample t-test is a statistical method used to compare the means of two related groups or conditions, in this case, the pre-test and post-test data collected from the same participants. This method is appropriate when the data points are paired or matched in some way, such as measuring the same individuals before and after an intervention or treatment. By applying the paired sample t-test to analyze the pre-test and post-test means, you were able to determine whether there was a significant difference between the two sets of data and assess the impact of the intervention or treatment on the outcome measure. This method is valuable for evaluating changes within the same group over time or under different conditions.

Ethical Considerations

Ethical considerations in research include obtaining informed consent from all stakeholders, ensuring the confidentiality of participant data, respecting the rights and dignity of the learners, minimizing harm and discomfort, aiming for beneficence in the research outcomes, and complying with relevant regulations and ethical guidelines. These considerations are essential to uphold ethical standards, protect participant rights, and ensure the integrity of the research conducted.

RESULTS and DISCUSSION

A. What is the numeracy level of Grades 1-6 learners before implementing Project Math-GALING?

Table 1.1
Division Unified Pre-Test Result

Score	Mean	MPS
Key Stage 1	**18.16**	**60.54%**
Key Stage 2	**24.89**	**62.30%**
TOTAL	**21.53**	**61.42%**

Table 1.1 presents the result in the Division Unified Numeracy Pre-Test. The weighted mean score is 21.53. The average Mean Percentage Score is computed as 61.42. The result indicates a need for further attention and intervention to improve the numeracy skills of key stage 1 and key stage 2 learners.

ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Table 1.2
Pre-Test in Level of Numeracy

GRADE	Enrolment	HIGH NUMERATES	MODERATE NUMERATES	Emergent	NON-NUMERATES
ONE	231	83	61	57	30
TWO	245	17	135	43	50
THREE	210	60	31	97	22
Key Stage 1	686	160	227	197	102
FOUR	278	9	128	109	32
FIVE	248	72	63	108	5
SIX	204	63	124	11	6
Key Stage 2	718	144	315	228	43
Total	1416	294	546	433	145

Table 1.2 presents that 304 or 21.47% of the total learners were high numerates , 542 or 38.28% were moderate numerates, 425 or 30.01% were emergent and 145 or 10.24% were non-numerates in the Division Unified Numeracy Pre-Test. Considering the implications of the result of the numeracy level among learners, teachers and stakeholders can work collaboratively to address the learning gaps and enhance the numeracy outcomes.

B. What is the numeracy level of Grades 1-6 learners after implementing Project Math-Galing?

Table 2.1
Division Unified Post - Test Result

Score	Mean	MPS
Key Stage 1	24.34	81.13%
Key Stage 2	32.03	80.08%
TOTAL	28.19	80.61%

Table 2.1 presents the result in the Division Unified Numeracy Post-Test. The weighted mean score is 28.19. The average Mean Percentage Score is computed as 80.61%. It shows that Project Math-Galing had a great impacts learners' performance in Mathematics. The data from the post-test highlights the effectiveness of Project Math-GALING in achieving its objectives of improving the numeracy skills of SAES learners.

ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Table 2.2
Post-Test Level of Numeracy

GRADE	Enrolment	HIGH NUMERATES	MODERATE NUMERATES	Emergent	NON-NUMERATES
ONE	231	94	132	5	0
TWO	245	136	93	16	0
THREE	210	63	99	48	0
Key Stage 1	686	293	324	69	0
FOUR	278	88	147	43	0
FIVE	248	137	99	12	0
SIX	204	148	56	0	0
Key Stage 2	730	373	302	55	0
Total	1416	666	626	124	0

Table 2.2 presents that 666 or 47.03% of the total learners were high numerates, 626 or 44.21% were moderate numerates, 124 or 8.76% were emergent and 0 or 0% were non-numerates in the Post Assessment of Division Unified Numeracy Post-Test. The table shows improvement in the numeracy levels after the implementation of project Math GALING. It indicates higher percentages of learners categorized as high and moderate numerates, reduction of emergent learners and elimination of non-numerates. This implies that the objective to enhance the numeracy skills of Grade 1-6 learners of Sta. Anastacia Elementary School by 0% non-numerates was met.

C. Is there a significant difference between pre-test and post-test?

Table 3
Descriptive Statistics for Pre-Test and Post-Test

	Mean	SD	t
PRE-TEST	21.53	5.90	-31.89
POST-TEST	28.19	5.19	

Based on the analysis of the research data, which includes a pre-test mean of 21.53, a post-test mean of 28.19, standard deviations of 5.90 for the pre-test and 5.19 for the post-test, a paired sample t-test was conducted, resulting in a t-value of -31.89. The negative t-value indicates a significant difference between the pre-test and post-test means, with the post-test mean being notably higher than the pre-test mean. Therefore, the findings suggest a substantial impact of the intervention or treatment implemented between the pre-test and post-test phases on the outcome measure under study.

Table 4
Percentage of Increase after the Implementation of Project Math - GALING

	PRE ASSESSMENT	POST ASSESSMENT	PERCENTAGE OF INCREASE
Grades 1-6 MPS	61.42%	80.61%	19.19%

It can be gleaned from table 4.1 that there is an increase percentage among Key Stage 1 And Key Stage 2 learners. The Key Stage 1 learners obtained a percentage of increase performance of 20.59% and the Key Stage 2

ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

learners improved percentage performance of 17.78%. All the test results prove a great leap in the performance of the learners.

CONCLUSIONS

Based on the information and data provided, the following conclusions are drawn:

1. There has been a significant improvement in learning outcomes

The paired sample t-test results show a statistically significant difference between the pre-test and post-test means, with a t-value of -31.89. This strongly suggests that the intervention or treatment implemented between the pre-test and post-test phases had a significant positive impact on the learners' performance.

2. Increased Performance Across Key Stages

The data indicates a notable increase in the performance of learners across both Key Stage 1 and Key Stage 2. Key Stage 1 learners achieved a 20.59% increase in their performance, while Key Stage 2 learners improved by 17.78%. Overall results demonstrate a 19.19% increase in the MPS between the pre-assessment and post-assessment. These results underline a substantial improvement in the overall performance of the learners, indicating the effectiveness of the intervention or treatment.

3. Reduction in Non-Numerate Learners

The data reveals a significant decrease in the number of non-numerate learners, from 145 in the pre-assessment to 0 in the post-assessment. This suggests that the intervention or treatment was successful in improving the numeracy skills and mathematical competence of the learners, effectively eliminating the non-numerate population.

In summary, the data analysis and observed outcomes indicate that the intervention or treatment implemented in this study had a substantial and positive impact on the learners' performance, leading to significant improvements in learning outcomes, increased performance across different key stages, and a reduction in the number of non-numerate learners. These conclusions highlight the effectiveness of the strategies or methods employed in the study and provide valuable insights for future educational interventions and practices.

RECOMMENDATIONS

Based on the findings and the conclusions drawn from the study, the following recommendations are given:

1. Teachers should be encouraged and motivated to use Project Math-GALING to enhance pupils' performance in Math in the next school year.

2. Enhance the Mathematical literacy across the curriculum.

3. Regularly assess and monitor the numeracy levels of learners to identify the areas of improvement and provide tailored support.

4. Provide ongoing professional development for teachers to enhance their skills in implementing these effective instructional approaches.

REFERENCES

DepEd Order No. 034, s. 2022. School Calendar and Activities for the School Year 2022–2023

Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge.

ETCOR Educational Research Center Inc.
SEC Reg. No. 2024020137294-00
Sta. Ana, Pampanga, Philippines
INTERNATIONAL MULTIDISCIPLINARY RESEARCH CONFERENCE
Website: https://etcor.org
iJOINED ETCOR
P - ISSN 2984-7567
E - ISSN 2945-3577
The Exigency
P - ISSN 2984-7842
E - ISSN 1908-3181

Hobson, T. (2022). The Impact of Covid-19 on Mathematics Education. https://cdn.ima.org.uk/wp/wp-content/uploads/2022/09/The-Impact-of-Covid-19-on-Mathematics-Education-from-MT-October-22.pdf

Lim, C. S., Tang, K. N., & Kor, L. K. (2012). Drill and practice in learning (and beyond). In N. M. Seel (Ed.), Encyclopedia of the sciences of learning (pp. 1040–1042). Springer.

Narayan, J. (2022). Education of children with diverse learning needs. In M. Ramchand, R. Khunyakari, & A. Bose (Eds.), Learning without burden (pp. 163–182). Taylor & Francis Group.

Pitogo, S. D., & Oco, R. M. (2023). Pupils' numeracy skills and mathematics performance. https://www.researchgate.net/publication/373110905_Pupils'_Numeracy_Skills_and_Mathematics_Performance

Smith, K. K. (2023). To address learning gaps, go deeper. Vol. 81 No.1, https://www.ascd.org/el/articles/to-address-learning-gaps-go-deeper

Sooknanan, J., & Seemungal, T. (2023). Mathematics education in the time of COVID-19: A public health emergency exacerbated by misinterpretation of data. Teaching Mathematics and its Applications: An International Journal of the IMA, hrac025. https://doi.org/10.1093/teamat/hrac025