

Project PINT (Post Pandemic Intervention for Numeric Tuning Up): Improving problem solving skill of low and non-numerate pupils in Mathematics

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Abstract

This study emphasizes on enhancing critical thinking and problem-solving skills among learners and eventually, bring light to connections between Mathematics and all sorts of field, concepts, and ideas in support to the implementation of LRP in numeracy specifically decrease low numerates from 418 to 100 and the non-numerates from 364 to 0. The researcher utilized descriptive method of research using the census or total enumeration composing of seven hundred eighty-two (782) low and non- numerate pupils of Pangil Elementary School as the target participants. After the implementation of the Project PINT it was found out that there is a significant result on the pupils performance in problem solving, from 418 low numerates and 364 non-numerates who became the target respondents shown changes upon given post-test. Only 385 out of 418 low numerates and 150 out of 364 non-numerates from grade 1 to grade 6. This connotes that the strategy employed by the researcher is effective. The study reaches its target goal to enhance critical thinking and problem-solving skills among learners and eventually, bring light to connections between Mathematics and all sorts of field, concepts, and ideas in support to the implementation of LRP in numeracy. Specifically, to decrease low numerates from 418 to 100 and the non-numerates from 364 to 0. Project PINT helped improve the pupils weaknesses and difficulties in problem solving. There are lots of factors that might contribute to pupils' weaknesses in this aspect, but it is through the initiative effort of the researcher, the school head with the help of the teachers who collaboratively work to solve and address this problem by using a lot of strategy to improve pupil's learning outcomes. Therefore, it is clear that once a teacher utilizes an interesting strategy and tool there is an increase on the pupils' performance. Pupils are becoming active and well-motivated if they had given a lot of interesting activities that wonders their curiosity in the classroom making them an active learners especially if technology is used as a strategy. They need to experience new things everyday to hold their interest.

Keywords: reading ability; technology; strategy; pupil's performance

1. Context and Rationale

Pursuant to Republic Act 10533 the Enhanced Basic Education Act that every graduate of basic education shall be an empowered individual who has learned, through a program that is rooted on sound educational principles and geared towards excellence, the foundations for learning throughout life, the competence to engage in work and be productive, the ability to coexist in fruitful harmony with local and global communities, the capability to engage in autonomous, creative, and critical thinking, and the capacity and willingness to transform others and one's self.

Swanson and Beebe-Frankenberger (2004) identified working memory as an ability that contributed to strong performance across both areas of mathematical cognition, but some unique cognitive abilities also emerged as important: phonological processing for computation and fluid intelligence as well as short-term memory for simple word problems. In an extension of this work following students' development of

calculations and problem-solving skill over 1 year, Swanson (2006) identified predictors of computation (inhibition or controlled attention, vocabulary knowledge, visual-spatial working memory) that differed from problem solving (working-memory's executive system, operationalized as listening span, backward digit span, and digit/sentence span). A latent variable of reading (i.e., phonological processing, timed and untimed reading of real words, timed reading of pseudo words, and comprehension) accounted for skill in both math outcomes.

Problem solving was the cornerstone of school mathematics (Yan, Wiles & YuYing, 2008). Therefore, teachers needed to properly show how to solve problems and make sure that the students really understood what they were doing and could explain the procedures.

In the study of Voyer (2011) many factors influence a student's performance in word (or textbook) problem solving in class. Among them is the comprehension process the pupils construct during their attempt to solve the problem. The comprehension process may include some less formal representations, based on pupils' real-world knowledge, which support the construction of a 'situation model'.

Further it should create a functional basic education system that will develop productive and responsible citizens equipped with the essential competencies, skills and values for both life-long learning and employment.

PROJECT PINT (Post-Pandemic Intervention for Numeric Tuning Up): Improving Problem Solving Skill of Low and Non-Numerate Pupils in Mathematics was based from the principles of the K to 12 curriculums we should produce and individual learner that could develop skills required for the 21st century skills that is why the main target of this study is to enhance the mathematical skills of learners.

Most pupils typically did better on computational skill exercises than word problems. Unsuccessful encounters with word problems early in their elementary schools experiences may well have lasting negative effects on the Mathematical development of many pupils. In fact, initial work with word problems could be source of Mathematics anxiety for many people.

The researcher found out from the pre-test result of Early Grades Mathematics Assessment and Numeracy Intervention Tool for Laguna Learners 364 learners were non-numerates and 418 were low numerates in solving mathematical problems. It is with this situation the author would like to contribute help in assisting pupils how they will be able to treat this competency as a challenge on their part. Solving Word problem provide one avenue for the development of understanding while at the same time providing the opportunity to develop computational skills.

The study made by Pascual and San Miguel (2023) revealed that school size, curricular classification and OPCRf (Office Performance Commitment and Review Form) rating significantly affect Mathematics MPS (mean percentage score). Also, as the historical pattern behaves in linear fashion, it was predicted that in the year 2028, KS1 (Key Stage 1) will have MPS of 81.357, KS2 is 81.481, KS3 is 71.347, and KS4 is 81.467.

This action research proposal will measure the effectiveness of the implementation of Project PINT on improving the Math Word Problem Skills of low and non-numerate pupils of Pangil Elementary School

1.1. Action Research Questions

This action research aimed to improve the pupils' problem solving skills for the school year 2022-2023. This will provide the necessary intervention measures to improve problem solving skills and reading ability of low and non-numerates.

Specifically, it seeks to answer the following question:

1. What is the level of the performance of elementary pupils in problem solving before the implementation of the Project PINT?
2. What is the level of the performance of elementary pupils in problem solving after the implementation of the Project PINT?

3. What is the improvement of the pupils upon the implementation of Project PINT?

2. Proposed Innovation, Intervention and Strategy

This study helps pupils in becoming familiar with the steps in problem solving. The teacher will post one math problem a week. Before the start of the math lesson, provide reading enhancement to overcome obstacles. One on one reading tutorial to develop reading comprehension. The steps in problem solving will be taught per session. The Project PINT will be conducted every Thursday, one hour after class in the afternoon.

3. Action Research Methods

3.1. Participants and/or other Sources of Data and Information

The subjects of this action research will be 364 non-numerates and 418 low numerate pupils in Pangil Elementary School for S.Y. 2022-2023. This is based on the Pre-Test result of Early Grades Mathematics Assessment (EGMA) and Numeracy Intervention Tool for Laguna Learners (NIT2L).

3.2. Data Gathering Methods

At the onset of data collection, the researcher will ask permission to conduct the research. After the approval, the researcher will start to conduct the research through the permission of the school head. The researcher will orient learner respondents with their corresponding parents. The researcher will gather the result of EGMA Pre-Test to determine the low and non-numerates among the respondents. First, the researcher will post one math problem on the wall per week. On the first session, pupils will read the problem individually then identify unfamiliar words in the problem. On the second session, they review the problem posted on the wall then introduce the first step in problem solving which is what is asked. Third session, they will write the problem posted on the wall then identify what are given numbers? On the fourth session, they will read the problem that they wrote to determine if they understand their hand writing. On the fifth session, they will identify what is/are operation to be used? On the sixth session, they will narrate the events happened in the problem and identify what is the number sentence? On the last session, they will role play the events happened in the problem then identify what is the answer in the problem. To determine the improvement of learners in the intervention program, the researcher conducted Post Test.

After data gathering, the results of the pre-test and post-test, were analyzed using appropriate statistical tools. Percentage was used to determine if there is improvement in the performance in problem-solving skills in Mathematics between pre-test and post-test.

3.3. Data Analysis Plan

The data gathered will be carefully analyzed and interpreted. This action research will make use of Quantitative Research method in data analysis.

Activities	Data to be Collected	Statistical Treatment
1. Administer the pre-test	Result of the pre-test	Percentage
2. Conduct weekly test on problem-solving	Weekly test result	Percentage
3. Administer the post-test	Result of the post-test	Percentage

3.4. Action Research Work Plan and Timelines

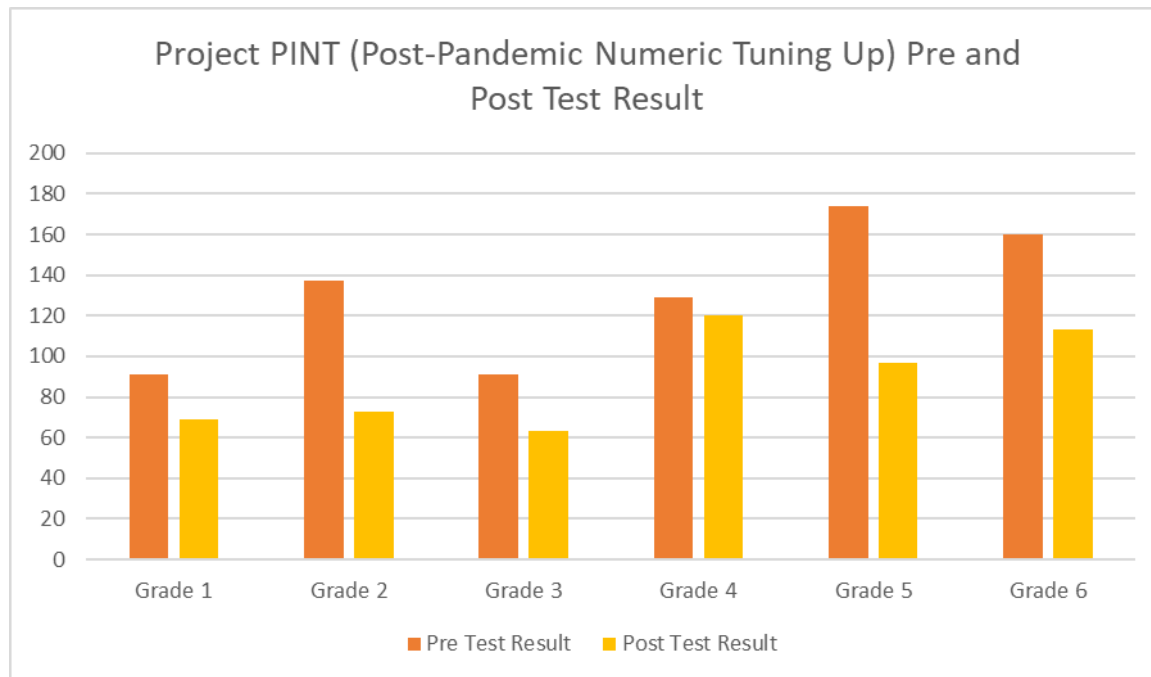
Objectives	Activities	Person/s Involved	Date of Activities	Funds
To determine the numeracy level of pupils	EGMA Pre-Test	Teacher and Learners	September 2022	Local Funds
To increase comprehension skill in reading word problem	Posting of one problem on the Wall: Pupils will read the problem individually then identify unfamiliar words in the problem	Teacher, low and non-numerates	February-2 nd Week of March 2023	Local Funds
To identify steps in problem solving (What is asked?)	Review the problem posted on the wall: Identify what is asked in the problem?	Teacher, low and non-numerates	Thursday-3 rd Week of March 2023	Local Funds
To identify steps in problem solving (What are given?)	Write the problem posted on the wall: Identify what are given numbers?	Teacher, low and non-numerates	4 th Week of March 2023	Local Funds
To identify steps in problem solving (What is/are operation to be used)	Read the problem written by the learner: Identify what is/are operation to be used?	Teacher, low and non-numerates	1 st Week of April 2023	Local Funds
To identify steps in problem solving (What is the Number Sentence)	Narrate the events happened in the problem: Identify what is the number sentence?	Teacher, low and non-numerates	2 nd Week of April 2023	Local Funds
To identify steps in problem solving (What is the answer)	Role Play the events happened in the problem: Identify what is the answer in the problem	Teacher, low and non-numerates	3 rd Week of April 2023	Local Funds
To assess the numeracy level of low and non-numerates who undergo Project PINT	EGMA Post Test	Teacher, low and non-numerates	4 th Week of April 2023	Local Funds

4. Discussion of Result

The graph below shows the implementation of the Project PINT (Post Pandemic Intervention for Numeric Tuning Up) Pre-test result revealed that there were low and non-numerates who were not able to answer problem solving. In grade 1 were 91, 137 in grade 2, 91 also in grade 3, 129 in grade 4, there were 174 in grade 5 and 160 in grade 6 with a total of 782.

After the implementation of the Project PINT the post test result shows that the low and non-numerates who were not able to answer problem solving were 69 in grade 1, 73 in grade 2, 63 in grade 3, 120 in grade 4, there were 97 in grade 5 and 113 in grade 6 with a total of 535.

The result shows that from 782 low and non numerates there were only 535 low and non numerates who were not able to answer problem solving. Two hundred forty seven or 31.59% pupils shows improvement on the level of performance in problem solving even in a few months of implementation of the Project PINT.



5. Reflection and Recommendation

5.1. Reflection

Numeracy is one of the DepEd's top priorities in early grades particularly among disadvantage pupils. Interventions are necessary to allow learners develop skills in numeracy in a manner and strategies which they learn best. This project is significant in helping to accomplish the aims to enhance critical thinking and problem-solving skills among learners and eventually, bring light to connections between Mathematics and all sorts of field, concepts, and ideas in support to the implementation of LRP in numeracy.

5.2. Recommendation

Based on the above findings. The following recommendations are suggested.

1. Continuous implementation of PROJECT PINT.
2. Integration of Mathematics lesson to other learning areas.
3. Further research should be undertaken on the effect of Project PINT on the level of performance of pupils in problem solving.

References

- Fuchs, L S., Fuchs, D., Hamlett, C. L., Lambert, W., Stuebing, K. and Fletcher, J. M. (2008). Problem solving and computational skill: Are they shared or distinct aspects of Mathematical cognition?" <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2802329/>
- Pascual, E. A. and San Miguel, N. V. (2023). Systematic forecasting and meta-analysis of learners' numeracy and literacy status in selected divisions of Region IV-A CALABARZON. *International Journal of Research Publications*. Vol. 136, Iss. 1, pp. 186-219. doi.org/10.47119/IJRP10013611120235665
- Swanson HL, Beebe-Frankenberger M (2004). The relationship between working memory and mathematical problem-solving in children at risk and not at risk for serious math difficulties. *Journal of Educational Psychology*. 2004;96:471–491
- Swanson HL. Cross-sectional and incremental changes in working memory and mathematical problem solving. *Journal of Educational Psychology*. 2006;98:265–281.
- Voyer, D. *Int J of Sci and Math Educ* (2011) 9: 1073. doi:10.1007/s10763-010-9239-y