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BUILDING THE CLASSROOM AS NUMBEROPOLIS AS A STRATEGY TO IMPROVE THE NUMERACY SKILLS OF GRADE TWO PUPILS OF TOMASA C. PASIA MEMORIAL SCHOOL

NOEMI A. MAGSOMBOL
Teacher III
Tomasia C. Pasia Memorial School
noemi.magsombol@deped.gov.ph

ABSTRACT

Based on the study, building the classroom as Numberopolis makes Mathematics meaningful and alleviate math anxiety that often depresses the ability to learn the value of Mathematics as well as develop imagination, global numeric linkages and numeracy skills among the learners. Thus, this study aims to investigate the effectiveness of building the classroom as Numberopolis as a strategy to improve the numeracy skills among grade two pupils of Tomasia C. Pasia Memorial School.

Keywords: *Numberopolis, Numeracy skills, Pre-Experimental, Grade Two Pupils, Tomasia C. Pasia Memorial School, Batangas Province*

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INTRODUCTION:

The knowledge, skills, attitudes, and behaviors known as numeracy are necessary for pupils to use mathematics in a number of circumstances. To effectively use mathematical knowledge and abilities and apply mathematical problems in real-world situations, one must first recognize and understand the importance of mathematics in society. This requires developing the essential attitudes and skills.

It is important to provide students and teachers plenty of time to work on mathematical exercises and problems throughout elementary mathematics training. In math learning domains, it takes a lot of time to determine the answers to problems. To find out the answer, one needs to have a rational and perceptive mind.

DESIGN/METHODOLOGY/APPROACH:

This study used Pre-Experimental method utilizing the one-group, pretest-posttest design. The chosen participants were 20 grade two pupils who were identified with numeracy skills problem based from the numeracy skills assessment tool. Data were collected using a validated 20-item assessment tool.

RESULTS / FINDINGS:

In general, the findings suggest that there is significant difference on the pretest and post-test of the grade two pupils after building the classroom as Numberopolis as a strategy to improve the numeracy skills among the participants.

RESEARCH LIMITATIONS/ IMPLICATIONS

The study is limited to the numeracy skills problem of the participants.

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ORIGINALITY/ VALUE

Building the classroom as Numberopolis promotes the enhancement of cognitive thinking and provides pupils with opportunities to think of Mathematics as world patterns, linking it to all areas of life. In addition, the strategy integrates their imagination with nonstandard shapes—an important aspect of applying mathematics in future endeavors and careers.

CONTEXT AND RATIONALE

Based on the consolidated least mastered competencies (lmc) last school year 2018-2019, second grading period in Mathematics 2 yielded with the most number of lmc. Majority of the grade two pupils have difficulty in understanding the concepts and have problem in numeracy skills. Thus, resulting to poor academic performance in Mathematics.

In the study conducted by Klemm (2015), the author suggested to adapt the Numberopolis that uses imagination, global numeric linkages and recycled materials encourage learners to experiment with math on their own terms. The multi-disciplinary engaging program alleviates math anxiety and sparks critical thinking. Its flexibility ignites collaboration with STEM programs and designing a learning environment with great positivity on numbers.

Thus, it is crucial to study the effectiveness of building the classroom as Numberopolis as an innovative strategy to improve the numeracy skills of grade two pupils of Tomasia C. Pasia Elementary School to foster understanding of an educational reform effort for the benefit of the said pupils.

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ACTION RESEARCH QUESTIONS

This study aims to investigate the effectiveness of building the classroom as Numberopolis as an innovative strategy to improve the numeracy skills of grade two pupils of Tomasia C. Pasia Elementary School.

Specifically, this study sought to answer the following questions:

1. What are the numeracy skills of the participants before the conduct of the intervention?
2. What are the numeracy skills of the participants after the conduct of the intervention?
3. Is there statistically significant difference on the numeracy skills of the participants before and after the conduct of the intervention

PROPOSED INNOVATION, INTERVENTION AND STRATEGY

The overall objective of the study in building the classroom as NumberOpolis is to make mathematics meaningful and alleviate math anxiety that often depresses the ability to learn the value of mathematics.

In this intervention, the pupils design an entire classroom with numbers 0-100, and/or higher-level math and science constants. This program will require about one-hour class periods depending on extent of collaboration. The program enhances cognitive thinking and provides pupils with opportunities to think of mathematics as world patterns, linking it to all areas of life. In addition, the program integrates their imagination with nonstandard shapes—an important aspect of applying mathematics in future endeavors and careers.

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An overall urban plan incorporating all created number houses and associated common areas, can be included depending on time restrictions. Teachers, older students or an extra team may be needed to prepare an overall urban or classroom plan.

ACTION RESEARCH METHODS

This study is centered on the effectiveness of building the classroom as Numberopolis as an innovative strategy to improve the numeracy skills of grade two pupils of Tomasia C. Pasia Elementary School using Pre-Experimental method utilizing the pretest-posttest design.

A. Participants and other Sources of Data

The chosen participants were 20 grade two pupils who were identified with numeracy skills problem based from the numeracy skills assessment tool. The said pupils were chosen using a non-random or purposive sampling technique.

B. Data Gathering Methods

Data were collected using a validated 20-item test from the numeracy skills assessment tool. After determining the numeracy skills of the pupils before the conduct of the intervention, the researcher applied the process of building the classroom as Numberopolis as part of the intervention program in improving the numeracy skills of the participants.

After the implementation of building the classroom as Numberopolis the test was given to the participants again which served as the post-tests. After the papers have been checked, the results of the tests were compared and analyzed using the paired t-test. Then the participants' results in the pretest and post-test were analyzed for any significant difference. This showed whether the process of integration of use of building the classroom as Numberopolis produced a positive effect in the participants' numeracy skills or not.

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C. Data Analysis Plan

In analyzing the answers of the participants, different statistical analysis and treatment of analyzing the data were used such as descriptive analysis and inferential analysis. Table summarizes the statistical treatments that were utilized for each research question posed for the study:

Research Question	Statistical Treatment
1. What are the numeracy skills of the participants before the conduct of the intervention?	Descriptive Analysis using Average and Standard Deviation
2. What are the numeracy skills of the participants after the conduct of the intervention?	Descriptive Analysis using Average and Standard Deviation
3. Is there statistically significant difference on the numeracy skills of the participants before and after the conduct of the intervention	Test of Significance for Difference Between Two Means using Paired T-test

DISCUSSION OF RESULTS AND REFLECTION

A. RESULTS

Below are the results of the pre-test of participants of the study:

Descriptive Statistics

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	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	20	3.00	7.00	4.5333	.77608
Valid N (listwise)	20				

Figure 1: Descriptive Statistics of the Pre-test of Participants

On the pre-test of the participants, it has an average of 4.5333 and standard deviation of .77608. The data shows that the participants have poor numeracy skills before the conduct of intervention.

Below are the results of the post-test of participants of the study:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Posttest	20	18.00	20.00	19.8178	.58190
Valid N (listwise)	20				

Figure 2: Descriptive Statistics of the Post-test of Participants

On the post-test of the participants, it has an average of 19.8178 and standard deviation of .58190. The data shows that the participants have high numeracy skills after the conduct of intervention.

Below is the comparison of means of the pre-test and post-test of participants:

Paired Samples Test

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	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Posttest	-15.2845	.15669	.21118	-14.63192	-13.76808	-67.241	19	.000

Figure 3: Comparison of Means of Pre-Test and Post-test of the Participants

In the comparison of means of the pre-test and post-test of participants, there is mean difference of 15.2845, t-value -67.241, 19 Degrees of Freedom and .000 significant difference on the pre-test and post-test. It shows that there is significant difference on the pre-test and post-test of participants after the building the classroom as Numberopolis was used as an intervention to improve the numeracy skills of the participants.

B. REFLECTION

This research identified that the results of the study provided an understanding of the effectiveness of building the classroom as Numberopolis as an innovative strategy to improve the numeracy skills of grade two pupils of Tomasia C. Pasia Elementary School. In general, the findings suggest that there is significant difference on the pretest and post-test of the participants after the integration of building the classroom as Numberopolis as an innovative strategy in teaching Mathematics among grade two pupils. This study suggested that building the classroom as Numberopolis promotes the enhancement of cognitive thinking and provides pupils with opportunities to think of Mathematics as world patterns, linking it to all areas of life. In addition, the strategy integrates their imagination with nonstandard shapes—an important aspect of applying mathematics in future endeavors and careers.

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ACTION PLAN

Programs/ Projects	Objective/s	Strategies/ Activities	Persons Involved	Target Date	Expected Outcomes	Source of Fund
Building the Classroom as Numberopolis for Math Teachers In-Service Training	Promote the use of Building the Classroom as Numberopolis	Conduct in-service training program for Math teachers about Building the Classroom as Numberopolis	Math teachers	May 2020	Building the Classroom as Numberopolis Strategy	Local Fund/ MOOE
Innovation	Prepare Innovation for Building the Classroom as Numberopolis program	Conduct in-service training program for Math teachers about innovation of Building the Classroom as Numberopolis program	Math teachers	May 2020	Building the Classroom as Numberopolis program with innovation	Local Fund/ MOOE

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COST ESTIMATES

The table below cost estimates for this action research:

CATEGORY OF COST	ESTIMATED AMOUNT
Intervention Materials	P 4,000.00

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Others (Bond Paper etc.)	P 1,000. 00
TOTAL	**P 6, 000. 00**