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RESEARCH ARTICLE

Improving Learners Numeracy Skills Through Explicit Teaching

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ABSTRACT

This action research used a quantitative research design, specifically a pre-test and post-test experimental design for the Grade 2-B class of Sibulao Elementary School, Vitali District, Zamboanga City Division. A total of 35 learners participated in this study. Pre-Test administration was done on September 11, 2023 and Post-Test administration was done on March 21, 2024. The test administration was personally administered and retrieved by the researcher-teacher. Findings revealed that the Grade 2-B learners, needed significant assistance with their numeracy skills. In the pre-test assessment for Grade 2-B learners, 34 or all of the learners were reported as not proficient (NoP) and require significant assistance. In the post-test, learners were reported to be significantly improving with 2 learners highly proficient (HP), 5 learners proficient (P), 17 learners nearly proficient (NeP), 7 learners low proficient (LP), and 4 learners not proficient (NoP). To address the salient findings of the study, recommendations relative to crafting an action plan for the reading remediation of the learners, conference with parent and learner and one-on-one tutorial is being recommended as the best intervention, intervention for numeracy include pedagogy interventions including exposing pupils to more drills and exercises, differentiated instruction and using manipulative, real and tangible objects and since the intervention program only lasted for 6 months during remediation classes with 35 minutes time allotment per day a conduct of summer enhancement program was conducted.

INTRODUCTION

Numeracy is the knowledge, skills, behaviors and disposition that learners need in order to use mathematics in a wide range of situations. It involves recognizing and understanding the role of mathematics in the world and having the disposition and capacities to use mathematical knowledge and skills purposefully. This implies that teachers shall put premium in developing the numeracy skills of the learners for them to survive and understand the world (Albay-Numeracy-Assessment-Tools-ALNAT-Manual, n.d.).

Numeracy is the **ability to see and use maths concepts in all areas of life**. Numeracy skills involve understanding numbers, counting, solving number problems, measuring, estimating, sorting, noticing patterns, adding and subtracting numbers, and so on (raisingchildren.net.au, n.d.) .

Numeracy skills is a part of our daily living. The reason why teachers introduce mathematics to the children through everyday play and activities. Many studies revealed that mathematics is the most difficult subject to teach because of the attitudes of the learners towards mathematics. Most learners find it difficult to learn math because they find it irksome engaging in numbers. It is essential therefore, that teachers are equipped enough to handle the mathematics especially in the lower grades were early mathematics sets as the foundations of learning. Math teachers as the source of the fountain of knowledge for numeracy skills plays a crucial role in the range of transferable sets of skills they can utilize in day-to-day activities.

Math teachers must use an effective strategy in teaching early mathematics. Teachers must be aware of what to teach and how to teach it. And most math teachers find it difficult in how to teach it. However, before proceeding on how to teach early maths, the teacher must delve the problem beforehand and this was done through the administration of the Division Numeracy Assessment Tool (D'NumAT) Pre-Test and draw a parallel of what is the best teaching strategies to be utilize. As per results of the D'NumAT Pre-Test, the researcher-teacher was determined to utilized explicit teaching as pedagogy in teaching early maths. According to Spainhour (n.d.) One of the most powerful tools for teaching math to students with learning disabilities is the use of explicit, systematic instruction. Explicit instruction usually has these components: clear modeling, think-alouds, multiple examples and immediate corrective feedback. Regularly teaching through explicit instruction has been shown to improve the performance of students with learning disabilities and learning difficulties in the areas of computation, word problems, and transferring known skills to novel situations—high-need areas for many with learning disabilities. (Mathematics Hub, n.d.) Directly explaining, demonstrating or modelling maths concepts and skills is explicit teaching.

Purpose

The major purpose of this action research is to improve the learner's performance in numeracy through utilizing the explicit teaching pedagogy. It also aims to determine the status of learner's mastery on the fundamental operations in Mathematics to promote better math performance.

METHODOLOGY

This study utilized a quantitative research design, specifically a pre-test and post-test experimental design for the group of respondents. Many research initiatives in the field of education focus on assessing the effectiveness of intervention programs. Methodologically, the pre-test and post-test approach is all about collecting data at two different times (before and after intervention) to determine the strength of intervention effects after the treatment has ended (Alessandri et al., 2017).

In this study, numeracy skills of conceptual understanding, computational skills and problem solving skills is administered to the learners in pre-test and post-test experiments.

Sampling Design

The study was conducted in Sibulao Elementary School, Vitali District, Zamboanga City Division involving thirty-five (35) Grade 2-B learners.

Instruments

The research instrument used for the study is the Division Numeracy Assessment Tool for Stage 1 (Grades 1-3) to determine each learner's numeracy level and the total mean scores of the group of respondents. The goal of the assessment tool is to evaluate the learners' numeracy skills.

Procedure

The group/class are told that the tests/tasks are being given so that the researcher-teacher can obtain information to help them learn mathematics. The researcher-teacher will read-out the questions and answers are recorded in a printed sheet. The researcher-teacher will translate the test questions from English to Chavacano and explain terms that need explanation.

The D'NumAT Pre-Test is administered at the beginning of the school year to evaluate the learners abilities and skills in mathematics before instruction.

The intervention program utilizing the explicit teaching pedagogy is facilitated for 6 months period during remediation classes.

The D'NumAT Post-Test is administered at the end of the school year to measure resultant knowledge and competence after the conduct of the intervention program.

These assessments are low-stakes and are not graded.

Statistical Treatment

The pre-test and post-test were computed for the mean of scores. A mean of score also known as the arithmetic average is calculated by adding up all the values in a set of numbers and then dividing by the total number of values. The mean score is used to measure the central tendency which represents the typical or most representative value in a dataset.

Mean=(Sum of all the observations/Total number of observations).

RESULTS

A pre-test and post-test assessment were conducted for the Grade 2-B class to date September 11, 2023 (pre-test) followed by a six-month numeracy skills intervention and the post-test assessment to date March 21, 2024.

Table 1. Pre-test and Post-Test mean scores.

	CU	CS	PS	Total Mean Score
Pre-Test Mean Score	0.16	0.02	0.15	0.09
Post-Test Mean Score	0.66	0.49	0.58	0.57

*where CU is Conceptual Understanding, CS is Computational Skill, PS is Problem Solving

Using the Division Numeracy Assessment Tool, pre-test scores show that Grade 2-B learners had a mean score of 0.16 in conceptual understanding, 0.02 mean scores in Computational Skills and 0.15 mean scores in Problem Solving. The overall score of Grade 2-B learners during the pre-test assessment is 0.09 indicating that the learners need major support in their numeracy skills. After the 6 months of intervention for Grade 2-B learners, however, there has been an observed increase in their numeracy skills scores as could be gleaned in Table 1. The total mean score of Grade 2B learners was 0.57 in the post-test showing an increase from 0.09. There was also an increase in the conceptual understanding of the learners from 0.16 to 0.66. The dramatic increase was also seen in computational skills increased from a score of 0.02 to a mean score of 0.49 and estimating also increased from 0.15 to a score of 0.58 for Problem Solving Skills.

Based on the results of the pre-test and post-test scores of Grade 2-B learners, the learners require significant assistance with their numeracy skills. In the pre-test assessment for Grade 2-B learners, 34 or all of the learners were reported as not proficient and require significant assistance. In the post-test, learners were reported to be significantly improving with 2 learners highly proficient (HP), 5 learners proficient (P), 17 learners nearly proficient (NeP), 7 learners low proficient (LP), and 4 learners not proficient (NoP) which could be gleaned in the attached appendices.

RECOMMENDATION

The significance of identifying learners' strengths and limitations from the outset is to assist them in achievable objectives are achievable and how to continue with an action plan for the learners. Now that the learners' strengths and weaknesses are identified through the assessment of three dimensions of their numeracy skills,researcher-teacher and the school need to make strategic actions to help achieve learning goals and strengthen the numeracy skills of learners in all aspects. It is therefore being forwarded that learners who were performing poorly in mathematics, conference with parent and learner and one-on-one tutorial was reported as the best intervention for the researcher-teacher and interventions for numeracy include pedagogy interventions including exposing pupils to more drills and exercises, differentiated instruction and using a manipulative, real, and tangible objects.

FURTHER ACTIONS

Since the intervention program only lasted for 6 months during remediation classes with 35 minutes time allotment per day a conduct of summer enhancement program was conducted.

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