SYNERGIZING ROLE PLAY (SRP) APPROACH: A STRATEGY TO IMPROVE THE PERFORMANCE OF GRADE VI LEARNERS IN VISUALIZING AND SOLVING WORD PROBLEM

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Completed 2024

Abstract

Synergizing Role Play (SRP) Approach is a form of collaborative learning and a dynamic teaching technique where learners have courage to actively engage in a unique and immersive way. It revealed its effectivity as a way of collaborative learning in visualizing and solving word problems. Learners are given the chance to get involve, explore and express themselves in the word problems in creative way. Grade VI learners (23 boys and 21 girls) were the participants of this action research. A Descriptive method was used where pretest on solving word problems had been conducted to the learner-participants before the intervention. Less than half of the participants (20%) got correct answers during the pretest which manifested less motivation in solving the word problems. Therefore, intervention is needed. Post-test had been conducted after the intervention which showed that more than half of the learner participants (86%) got correct answers. This suggests that the learners become motivated in answering word problems and the intervention is effective. The t-test result or the computed value was -45.70 (absolute value) and the table t or the critical value was 3.182. α (alpha) is set at .05, df (degrees of freedom) is 3. T-test (-45.70-absolute value) > table t (3.182). The result of the t-test revealed significant difference in the performance of the Grade VI learners in visualizing and solving word problems before and after the intervention. This implied that the intervention has a greater opportunity to improve problem solving skill of the learners.

Keywords: Problem Solving,   Role Play,   Collaborative Learning

Acknowledgement

First and foremost, the researcher would like to thank the Father Almighty for giving her strength, provision and people who extended their valuable support and assistance which have contributed much to the success and completion of this undertaking.

DepeD Regional X for the gracious approval and making this research one of the grantees of BERF;

DepeEd Tangub City spearheaded by pro-active Schools Division Superintendent Dr. Shambaeh Abantas-Usman, systemic Assistant Schools Division Superintendent Dr. Erlinda G. Dael, CID Chief Angelina B. Buaron, SGOD Chief Lorna C. Peñonal for the suggestions, recommendations challenges and encouragement for the improvement of this endeavor;

Division Research Coordinator, Mr. Shieldon F. Honculada who unselfishly extend his support in the preparation of this manuscript, and for his willingness in accommodating the researcher's incessant queries;

Southwest A District In-Charge, Mrs. Marylyn C. Banawan for the endless motivation from the start up to this end;

Panalsalan Elementary School teaching force headed by School Head Mrs. Roberta P. Singgit for making the researcher feel light-hearted in conducting the research;

To the different schools who undoubtedly accepted this research;

To the parents and learners who have been the participants for the support and cooperation;

To the family of the researcher, who have been the strength and inspiration of this craft through ups and downs;

To all who have helped in any way for the realization of this research, hats off to all of you. Thank you so much!

Content and Rationale

Problem solving is one of the 21st century skills that a learner must developed. It is a higher order thinking skill that promotes critical thinking, effective reasoning power, analysis, interpretation, and synthesizing information. It connects the person to the world of creativity, artistry, curiosity, imagination, and personal expression. It also provides an opportunity for collaboration, teamwork, perseverance, self-direction, planning, self-discipline, and adaptability. It teaches different values and virtues that exploit opportunities and exert control over the future. Because of these impacts to individuals, problem solving is incorporated in the curriculum in order to produce learners who can live in this modern days which are packed of challenges and can survive the battles of the fittest(Rahman, 2019).

Several teaching strategies and approaches in dealing visualizing and solving word problems in Mathematics have been employed to learners in the classroom. Teaching innovations and interventions have been applied to facilitate comprehension on word problems. Varied activities which aimed to increase learners' performance in Mathematics are utilized purposively. Visualization of word problems involves creating mental or graphical representations to better understand and solve complex scenarios described in textual form. It often includes translating the given information into diagrams, charts, or other visual aids. More than that, teachers teach basic steps in visualizing word problems until final answer is achieved.

This is a real scenario as employed by the Mathematics Grade 6 teacher of Panalsalan Elem. School to Grade 6 learners. But unfortunately, learners still find hard in visualizing and solving given word problems. In any formative and summative test in Mathematics, learners got low scores in word problems and to find out that solving word problems is one of the least mastered skills in Mathematics as shown in the MPS of every grading period this school year 2023-2024. This is one of the reasons of having this action research. The proponent made an intervention to help the performance of the learners in solving word problems through a certain teaching approach or teaching intervention which will ignite them to act the situation in the word problem.

Based on observation, children nowadays show better performance through collaboration, teamwork and any shared activity. It is supported by Algani, 2021 which states that collaborative learning transforms the learners into a valuable participant in the educational process. It encourages him to engage in conversation and discussion, improve his academic performance and psychological well-being, and hone his problem-solving abilities. It emphasizes that learners become more engaged if they are in group. Through acceptance and friendship in the group, the more they could draw better learnings.

Collaborative learning could be done in many ways. One of those is role play. Role-play is viewed by scholars as an effective active learning strategy: it encourages participation among passive learners, adds dynamism to the classroom and promotes the retention of material (Stevens, 2015). It tries to emphasize that role play activity could help learners for better visualization and solving word problems. The more they become involved, the more retention takes place.

Role-play is a dynamic teaching technique that encourages students to actively engage with content in a unique and immersive way. In the context of mathematics, role-play can be a powerful tool for visualizing and solving word problems collaboratively, (Kurshumlia, 2017). The effectivity of role play was revealed as a way of collaborative learning in visualizing and solving word problems. Learners were given the chance to explore and express themselves in creative way.

With those facts mentioned above which revealed that solving word problems is at risk and classified as least mastered skill in Mathematics and considering the behaviors of 21st century learners, they become expressive through collaborative manners, it was then the purpose of this research to find out the effects of SRP Approach or Synergizing Role Play in visualizing and solving word problems. The proponent was trying to open the mind of the teachers of engaging another learning style which is aligned to the interests of the learners in these modern days.

Innovation, Intervention and Strategy

Due to the alarming performance of the learners in visualizing and solving word problems, the researcher is suggesting this innovation/intervention.

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After the discussion on specific topic of solving word problems, the learners will be in group. Every group will be given different word problem. They will be instructed to do a role play on their assigned word problem for better visualization of word problem. This time, role play allows learners to step into the shoes of different characters, scenarios, or real-world situations related to the word problem. By assuming specific roles (such as a shopkeeper, mother, father, vendor, scientist, or architect), learners gain a deeper understanding of the problem context. For instance, if the problem involves buying and selling items, students can role-play as buyers, sellers, or even market analysts and they will act accordingly. In this strategy, many aspects of the learners may be developed. First, it leads them to critical thinking and perspective-taking. During role-play, learners must think critically about the problem, considering various angles and viewpoints. They analyze information, make decisions, and predict outcomes based on their assigned roles. This process encourages empathy and helps students see problems from different perspectives, fostering a holistic understanding. Second, it brings them better collaboration and communication. Role play inherently involves interaction and communication among students. As they negotiate, discuss, and strategize within their roles, they learn to articulate their reasoning and listen to others. Collaborative problem-solving becomes more effective as students pool their ideas and insights. Third, it promotes language development. Mathematical vocabulary and terminology play a crucial role in word problem solving. Through role-play, students actively use and reinforce mathematical language. They learn to express mathematical concepts, operations, and relationships accurately. Fourth, skill transfer takes place. Role-play provides a safe environment for practicing problem-solving skills. Learners transfer these skills from the role-play scenarios to

real-world math problems. For instance, if they simulate a construction project, they can apply measurement, area calculations, and budgeting skills. Fifth, it teaches them creativity and engagement. Role-play sparks creativity and imagination. Learners invent solutions, explore alternatives, and adapt their strategies. The active participatory nature of role-play keeps students engaged and motivated.

In summary, role-play transforms abstract word problems into tangible experiences. It bridges the gap between mathematical concepts and practical application, fostering deeper learning and collaborative problem-solving skills. So, let's step into our roles and tackle those word problems together!

Action Research Questions

This study aimed to improve the performance of Grade VI learners of Panalsalan Elem. School in visualizing and solving word problems during the school year 2023-2024 using SRP Approach.

Specifically, it sought to answer the following sub-problems:

1. What is the performance of Grade VI learners in visualizing and solving word problems before the intervention?

2. What is the performance of Grade VI learners in visualizing and solving word problems after the intervention?

3. Is there a significant difference between the performance of Grade VI learners in visualizing and solving word problems before and after the intervention?

4. What are the significant differences between the performance of Grade VI learners in visualizing and solving word problems before and after the intervention?

Action Research Methods

There are elements to consider to fully understand the conduct of this action research and to achieve reliability of the result. This chapter presents the participants or the respondents, sources of data and information, data gathering methods, and data analysis plan. The proponent must identify these elements first so the action research would be done smoothly, fairly and honestly.

Particularly, the researcher used descriptive method of research. A pretest on solving word problems following the basic steps was conducted to the learner-participants before the intervention. Then, a post test was done by the learner-participants after the intervention to compare the scores of the pretest and posttest and find the significant difference using paired t-test.

Participants

The identified Grade VI Section Fortune of Panalsalan Elementary School which consists of 23 boys and 21 were the participants of this action research.

Data Gathering Methods

In gathering the data of this study, several steps have been undertaken by the researcher. First, the researcher collected data through questionnaires. Second, to confirm the validity of the collected data, the researcher asked assistance of the school head and co-teachers. Third, the researcher explained to parents, co-teachers and to learners about the implementation of SRP Approach which they are about to use in visualizing word problems. Fourth, responses and observable changes were recorded after the modified strategy/approach has introduced.

This study utilized questionnaires on pretest and posttest as data-gathering instrument. It was done in two durations; pre - implementation and post implementation. During pre-implementation stage, questionnaires were served to the respondents as pretest to draw strength and weakness in solving

word problem. After post implementation, respondents were given questionnaires as posttest, with regards to the new approach implemented by the teacher. The process of getting information during pre-implementation and after post implementation aimed to draw comparison of the performance of the participants and comparison of participants behavior. The comparison will be presented through mean percentage score (MPS) followed by interpretation which will determine the participants level of performance.

Paired t- test will be used to determine the significant difference between the pre-test and the post test results of the performance.

Data Gathering Flow

Implementation Stage	Activities	Objectives	Persons Involved	Means of Data Validation	Remarks on the Results of Data Validation
Pre-Implementation Phase	Questionnaires as pre test in solving word problems following standard steps are given to the tl participants	Draw strength and weaknesses of the respondents in solving word problem following the standards in solving word problems	Learner-participants	Use of Mean Percentage Score	-Effective or less effective - Motivated or less motivated
Post Implementation Phase	Questionnaires as posttest in solving word problems following standard steps are given to the participants	Draw strength and weaknesses of the respondents in solving word problem following the standards in solving word problems	Learner-participants	Use of Mean Percentage Score	-Effective or less effective - Motivated or less motivated
	Compare the results between pre-implementation and post implementation.	Draw better conclusion and recommendation towards the new approach in solving word problems	Researcher, school head and co-teachers	Use of Mean Percentage Score	Implementation of SRP Approach is either approved or disapproved.

Discussion of Results and Reflection

        This part of the study presents the analysis and interpretation of the result.

Pre-implementation

Table 1

1. Result on Pretest conducted

Indicators (Standard steps in solving word problems)	No. of Participants	Frequency of Correct Answer	%	Frequency of Incorrect Answer	%

Understand
  a. What is asked?
  b. What are given?
	44	10
		10
			23%	34
				34
					77%

Plan
  a. What operation to be used?
  b. What is the mathematical sentence?
	44	10
		
		10
			23%	34
				
				34
					77%

Solve a. Solution	44	8	18%	36	82%

Check
  a. Reverse strategy/oppo site operation
  b. State the final answer
	44	6
		
		6
			14%	38
				
				38
					86%

Average	**44**	**9**	**20%**	**35**	**80%**

        The table shows the result of the pretest before the implementation of SRP Approach. It reveals the fact that less than half of the participants (20%) got correct answers in the pretest with respect to the standard steps in solving word problems. It further reveals that the learners are less motivated in answering/solving the word problems. Therefore, intervention is needed.

Post-implementation

Table 1

1. Result on post test conducted (Learner participants are engaged in SRP Approach before answering the test)

Indicators (Standard steps in solving word problems)	No. of Participants	Frequency of Correct Answer	%	Frequency of Incorrect Answer	%
Understand c. What is asked d. What are given?	44	40 40	91%	4 4	9%
Plan c. What operation to be used? d. What is the mathematical sentence?	44	38 38	86%	6 6	14%
Solve b. Solution	44	37	84%	7	16%
Check c. Reverse strategy/opposite operation d. State the final answer	44	37 37	84%	7 7	16%
Average	**44**	**38**	**86%**	**6**	**14%**

The table shows the result of the post-test after the implementation of SRP Approach. It reveals the fact that more than half of the learner participants (86%) got correct answers with respect to solving word problems. It further reveals that the learners are motivated in answering/solving the word problems. Therefore, intervention is effective.

Finding the Significant Difference

I. Compute the mean of two conditions and the difference scores

Indicators	Pretest	Posttest	Difference	Difference²
1.Understand	10	40	-30	900
2. Plan	10	38	-28	784
3. Solution	8	37	-29	841
4. Check	6	37	-31	961
Total	**34**	**152**	**ΣD= -118**	**ΣD² = 3486**
	$M_1 = 8.5$	$M_2 = 38$		

II. Compute the mean of sample difference score and SSD

$\overline{D}$ = mean of sample difference
ΣD = Summation of Difference Scores
N = Total No. of Indicators
SS_D = Sum of Squares of Difference Scores

$$\overline{D} = \frac{\Sigma D}{N}$$
$$= \frac{-118}{4}$$
$$= -29.5$$

$$SS_D = \Sigma D^2 - \frac{(\Sigma D)^2}{N}$$
$$= 3486 - \frac{(-118)^2}{4}$$
$$= 3486 - \frac{13924}{4}$$
$$= 3486 - 3481$$
$$= 5$$

III. Compute the t-statistics (t-test)

t = t -test

D = mean of sample difference

μ_D = mean of the population
    of difference scores

SS_D = Sum of Squares of
Difference Scores

$$t = \frac{\overline{D} - \mu_D}{\sqrt{\dfrac{SS_D}{N(N-1)}}}$$

$$= \frac{-29.5 - 0}{\sqrt{\dfrac{5}{4(4-1)}}}$$

$$= \frac{-29.5}{\sqrt{\dfrac{5}{4(3)}}}$$

$$= \frac{-29.5}{\sqrt{\dfrac{5}{12}}}$$

$$= \frac{-29.5}{\sqrt{0.4167}}$$

$$= \frac{-29.5}{0.6455}$$

$$= -45.70$$

IV. Identify the critical value (table t)

df = degrees of freedom

df = N-1

   = 4-1

   = 3

α (alpha) = .05

Level of Significance for Two-Tailed Test (α)

df	.20	.10	.05	.02	.01	.001
1	3.078	6.314	12.706	31.821	63.657	636.619
2	1.886	2.920	4. 303	6.965	9.925	31.598
3	1.638	2.353	3.182	4.541	5.841	12.941
4	1.533	2.132	2.776	3.747	4.604	8.610
5	1.476	2.015	2.571	3.365	4.032	6.859
6	1.440	1.943	2.447	3.143	3.707	5.959
7	1.415	1.895	2.365	2.998	3.499	5.405
8	1.397	1.860	2.306	2.896	3.355	5.041
9	1.383	1.833	2.262	2.821	3.250	4.781
10	1.372	1.812	2.228	2.764	3.169	4.587

Source: Derived from the book of statistics/Psychological Statistics

Therefore: table t = 3.182

V. Compare the t-test and the table t

t-test = -45.70 (absolute value)

table t = 3.182

Note: If t-test is greater than table t, significant difference occurs.

     Therefore, there is a significant difference in the performance of the Grade VI pupils in visualizing and solving word problem before and after the intervention.

Findings

The study resulted in the following salient findings:

Pre-implementation

1. The fact revealed that less than half of the participants (20%) got correct answers from the total number of items in the pretest. This implies that they are less motivated in answering/solving the word problems. Answering the word problems by just following the standard steps seems a very passive way and it never arouse their interest to think critically. Therefore, intervention is needed.

Post-implementation

1. The fact showed that more than half of the learner participants (86%) got correct answers with respect to solving word problems in the post test. This suggests that the learners become motivated in answering/solving the word problems. Therefore, the intervention is effective.

Conclusion

The performance of Grade VI learners in visualizing and solving word problems before the intervention is low which labeled as least mastered skill. But after the intervention has employed, it becomes significantly improving. Thus, it shows significant difference between the performance of Grade VI learners in visualizing and solving word problems before and after the intervention. It simply implies that the intervention is effective. It is of great help to improve the performance of the learners in visualizing and solving word problems.

Recommendation

After thorough evaluation and statistical checking of data before and after the implementation of SRP Approach, it was found out that the intervention is effective to improve the performance of the learners in visualizing and solving word problems. The intervention is applicable in

Mathematics of all grade levels. And that, it is a way to increase the MPS in Mathematics as a whole. Therefore, the intervention SRP Approach is worth for dissemination through LAC Session and even Division and Regional Presentation for its positive and beneficial impact to teaching and learning process.

Action Plan

Objectives	Task	Success Indicator	Time Frame	Resources
Create differentiated learning opportunity to least mastered skill	Innovation implementation	100% implementation/ participation with high performance	Whole year round	Teachers, parents, learners, school head
Develop positive attitude in dealing word problems	Innovation implementation	100% implementation/ participation with high performance	Whole year round	Teachers, parents, learners, school head
Achieve 100% learners' comprehension in word problems	Innovation implementation	100% implementation/ participation with high performance	Whole year round	Teachers, parents, learners, school head
Achieve mastery in visualizing and solving word problems	Innovation implementation	100% implementation/ participation with high performance	Whole year round	Teachers, parents, learners, school head
Develop learners who are critical thinkers and Mathematically proficient	Innovation implementation	100% implementation/ participation with high performance	Whole year round	Teachers, parents, learners, school head
Achieve 100% learners'	Innovation implementation	100% implementation/	Whole year round	Teachers, parents, learners,

promotion in Mathematics 6		participation with high performance		school head
Share to co-teachers in school and even teachers from other school during LAC Session	Innovation implementation	100% implementation/ participation with high performance	Whole year round	Teachers, parents, learners, school head
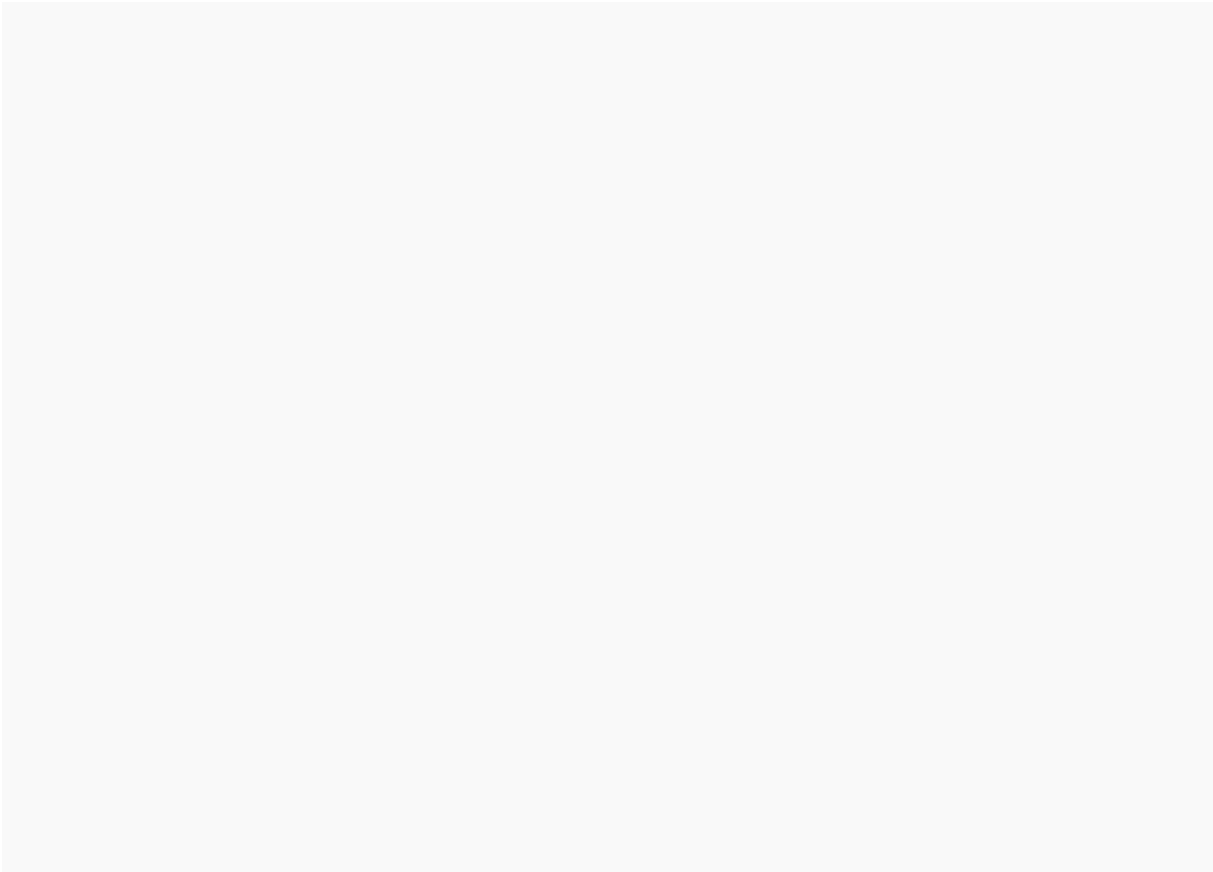
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