



De La Salle University  
Emilio Aguinaldo College  
Bagong Bayan, Dasmariñas, Cavite

PROBLEM SOLVING ABILITY OF GRADE V PUPILS  
IN DASMARINAS BAGONG BAYAN AREA E  
ELEMENTARY SCHOOL: A QUASI-  
EXPERIMENTAL STUDY

ABSTRACT

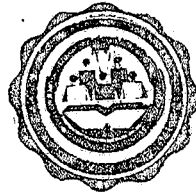
One of the most important phases of Elementary Mathematics is problem solving because it concerns with the daily interaction of the pupils with his peers and the people they meet in their everyday lives. This world is full of mathematical computation and even a single situation calls the idea of problem solving. Essentially, therefore, the school should exert every possible efforts to equip the pupils with the essential abilities and skills to enable them to solve functional problems of modern living.

Thus, in conformity with the above statements, a study was undertaken along this line entitled: Problem Solving Ability of Grade V Pupils of Dasmariñas Bagong Bayan Area E Elementary School, District II of Dasmariñas, Division of Cavite.



More specifically, it attempts to answer the following questions:

1. What are the pre and post-test mean scores in the subskills of the diagnostic test in problem solving in Elementary Mathematics of Grade V pupils of Dasmariñas Bagong Bayan Area III Elementary School?
2. Based on the results of the diagnostic test in problem solving of the aforesaid pupils, what are their manifested difficulties or weaknesses?
3. What are the difficulties encountered by the children in problem solving in Elementary Mathematics as revealed by the teacher's diagnosis?
4. Is there a significant difference of the pre and post test mean scores in problem solving in Elementary Mathematics between male and female Grade V pupils?
5. Is there a significant difference between the pre and post-test mean scores in the subskills of problem solving in Elementary Mathematics of the Grade V pupils?



### Hypotheses

The following hypotheses were tested in this study:

1. There is no significant difference of the pre-test and post-test mean scores in problem solving in Elementary Mathematics between male and female grade five pupils.
2. There is no significant difference between the pre-test and post test mean scores of Grade V pupils.

### Methodology

In this study, there were two research methodologies employed. The descriptive-survey method of research and the quasi-experimental design, with certain modifications, the non-comparable pre and post test design. The former was used because it lends itself to accurate description of individuals, such as the subjects under study, and the latter method allows the natural classroom setting without resorting to sampling equivalence.

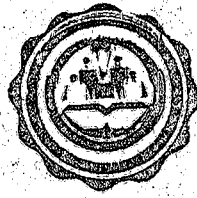
A teacher-made diagnostic test in problem solving was constructed for the purpose of this study. This test was pre-tested and the reliability coefficient is .85 for



the whole test. The diagnostic test is composed of two parts: Part I is the problem-analysis consisting of four subskills. Each subskill is akin to the formal progression of step in problem solving. It is composed of the following: a) Knowing what is asked in the problem, b) Determining the facts needed in the solution of the problem, c) Determining what process or processes to be used, and d) Estimating the answer. Part II of the test comprised the computational aspect of the test involving one, two, and three-step problems.

The aforesaid test was administered to the Grade V pupils. The results of the test were analyzed and weaknesses in problem solving were identified. From the pupils' weaknesses and deficiencies being observed and known through the diagnostic test administered, a remedial teaching development program in problem solving was planned and implemented for five weeks by the Grade V Elementary Mathematics teachers.

To determine the effectiveness of the remedial teaching upon the grade five pupils, a post test was administered to the same subjects. This test is similar to the diagnostic test used in the identification of weaknesses.



The mean scores by sections and subskills were computed for both pre and post tests. This mean scores were subjected to a t-test of significance statistical analysis to determine if there exists a significant difference between the male and female pre-test mean scores. The same analysis was also applied to find out if there was a significant difference between the pre and post test mean scores by sections and in each subskill for the grade five pupils.

### Findings

Specific Question No. 1. What are the pre and post-test mean scores in the subskills of the diagnostic test in problem solving in Elementary Mathematics of the Grade V pupils?

#### Pre and Post test Mean Scores in Problem Analysis.

On the average, the pre and post tests mean scores by subskills are the following:

For "Knowing what is asked in the problem" the pre-test mean score is 1.47 and 2.66 for the post-test mean scores.

In "Knowing what facts are needed in the solution of the problem", the pre-test is 1.40 and 2.47 for the



post-test mean scores.

In "Determining the process or processes to be used" the children obtained a pre-test mean score of 1.38 with a post test mean score of 2.71, and in "Estimating the answer" the pupils, obtained a pre-test mean score of 1.37 with a post-test mean score of 2.24.

On the whole, for the four subskills, the average of the four sections is 1.41 for the pre-test and 2.52 for the post-test. This gives a mean difference of 1.11, and indication that the pupils improved in their ability in problem solving analysis.

Pre and Post-tests Mean Scores (Computational).

This computational part of the diagnostic test consists of one, two and three-step problems. The average mean scores both pre and post tests in one-step problem are 1.33 and 2.60 respectively. For two-step problem, the pre and post test mean scores are: 1.31 and 2.72 and for the three-step problem are 1.25 for the pre-test mean score and 2.66 for the post test.

On the whole, the average of the aforesated mean scores for both pre and post tests are: 1.30 for the pre-test and 2.66 for the post test (with a mean difference of



1.36). These data show that there was a marked improvement in the skills of the children as evidenced by the mean difference of 1.36.

Specific Question No. 2. Based on the results of the diagnostic test in problem solving of the aforesaid pupils, what are their manifested difficulties or weaknesses?

The identified weaknesses in problem solving are classified in two aspects. Under "Problem Analysis" the most difficult is "Estimating the Answer", with a frequency of errors of 465 or 67%, followed by "Knowing the process or processes", with a frequency of errors of 460 or 66%. The least difficult is "Knowing what is asked" with 430 or 62% frequency of errors.

In computation, the most difficult is solving three-step problem with 569 or 82% frequency of errors, followed by solving two-step problem with a frequency of errors of 547 or 79% and the last was solving one-step problem with 487 or 70% frequency of errors.

Specific Question No. 3. What are the difficulties encountered by the children in problem solving in Elementary Mathematics as revealed by the teachers' diagnosis?



Problem solving has been the stress of this study and to trace the difficulties encountered by the school children in this phase of learning is of great significance to the investigator and to the present study undertaken.

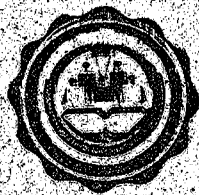
The following were the difficulties encountered by the Grade Five children in Mathematics as revealed by the teachers' diagnosis:

1. Difficulty in determining what is asked in the problem
2. Difficulty in finding out facts needed
3. Difficulty in determining the process or processes to be used in the solution of the problem
4. Difficulty in estimating the answer, and,
5. Difficulty in solving one, two and three-step problems.

Specific Question No. 4. Is there a significant difference between the male and female pre-test and post-test mean scores in the subskills of problem solving in Elementary Mathematics of the Grade V pupils?

The results of the t-test of significance between male and female pre-test and post test mean scores in all





the subskills of problem solving in Elementary Mathematics revealed "not significant" difference. The T-value or critical ratios for all the subskills of all the four grade five sections ranged from .08 to 1.7 for the pre-test and .08 to 1.87 for the post-test. The required value is  $t = 2.01$ , with  $df = 50$  at .95 level of significance.

This means that male and female grade five pupils have the same abilities to solve problems in Elementary Mathematics.

Specific Question No. 5. Is there a significant difference between the pre and post-test mean scores of the subskills in problem solving in Elementary Mathematics of the grade five pupils?

The results of the t-test of significance between the pre and post test mean scores in all the four sections for all the subskills indicated a "very significant" difference. The t-value or critical ratios for all the subskills ranged from 7.8 to 25.5.

This means that the pupils' ability to solve problems in Elementary Mathematics significantly improved.



### Testing of Hypothesis

Hypothesis No. 1. There is no significant difference of the pre-test and post-test mean scores in problem solving in Elementary Mathematics between male and female grade five pupils.

This hypothesis, of no difference is accepted. The statistical proof of this is the mean difference of .02 for the pre-test and .01 for the post-test mean scores between male and female grade five pupils.

This means that, at the start of the investigation, the ability of boys to solve problems in Elementary Mathematics does not differ from the girls.

Hypothesis No. 2. There is no significant difference between the pre and post-test mean scores of grade five pupils.

This hypothesis is hereby rejected. The statistical analysis using t-test of significance between the pre and post-test mean scores revealed "very significant" difference. This means that the children have improved in their ability to solve problems in Elementary Mathematics due to the remedial teaching given to them.



### Conclusions

In the light of the findings of this study, the following can be concluded:

1. There exists no significant difference in the problem-solving ability of male compared to female grade five pupils.
2. The subskills closely associated with problem solving ability, if properly developed, can improve problem solving in Elementary Mathematics.
3. Remedial measures if properly planned and implemented is highly effective in easing pupils' difficulty in problem solving.
4. The weaknesses in the subskills stated in this study which play an important role in problem solving can certainly be remedied.
5. Above all, it is visually proven that attitudes of the teachers as unmeasured variables in this particular study affect much in developing the capacity in problem solving of the Grade V pupils of Dasmariñas Bagong Bayan Area E Elementary School.



### Recommendations

In the light of the foregoing findings of the study, the following recommendations are offered:

1. Diagnosing pupils' capabilities in problem solving is a must and every Elementary Mathematics teacher should be encouraged to conduct diagnostic test so that provisions of the proper remediation and guidance be made available to those who have difficulties in the subject.
2. Every teaching-learning situation should be made meaningful to the pupils so that they could feel its value to their everyday lives.
3. The mathematics room should be equipped with all the teaching aids necessary to make the pupils think, investigate, and manipulate or perform meaningful learning activities.
4. One of the phases of learning among elementary pupils which needs careful and systematic development is Mathematics, so careful attention should be given on this particular phase and application and utilization of the skills developed should be emphasized.



De La Salle University  
Emilio Aguinaldo College  
Bagong Bayan, Dasmariñas, Cavite

xvii

5. Learning by doing is highly recommended so that pupils could comprehend better on teaching-learning situation presented to them.
6. Provisions of variety of techniques, strategies and activities should be made available to the pupils with emphasis on vocabulary development and comprehension which are needed skills to be used in analyzing problems to be solved.