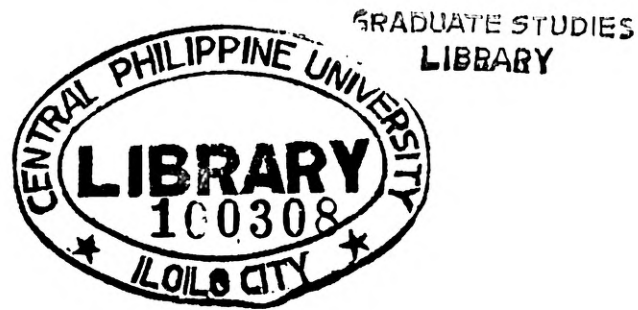


**STUDENT'S ATTITUDES AND BELIEFS: THEIR RELATIONSHIPS TO  
MATHEMATICAL PROBLEM SOLVING PERFORMANCE**

**A Thesis  
Presented to  
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by

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by

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## **ABSTRACT**

This study primarily aimed to determine the second year high school students' attitude towards and predominant beliefs about mathematical problem solving as well as their problem solving performance. It further aimed to determine the relationships among the variables identified. The scores of the students on attitude and belief questionnaires measured their attitudes and beliefs, respectively. On the other hand, students' performance in problem solving was based on their scores in problem solving questionnaire. Moreover, this study was designed to determine if there are significant differences in the students' attitude and performance in problem solving when grouped according to gender.

The researcher used a descriptive-correlation design for this study. Samples were drawn using the multi-stage and the stratified random sampling. To gather the data, the Mathematics Belief Questionnaire, the Attitude Inventory Questionnaire and the Problem Solving Questionnaire were employed. Means, frequencies and standard deviations were utilized to describe the subjects' attitude, predominant beliefs and performance in solving mathematical problems. To determine whether there are relationships that exist among these variables, the Pearson Product-Moment Correlation Coefficient and the Partial Correlation Coefficient were utilized. For the significant differences in the variables

when classified as to gender, the t-test and the z-test for proportions were employed, set at 5 percent level.

### **Findings**

The performance of second year high school students on problem solving fell below the 50 percent criterion. Both male and female students achieved less than 50 percent of the test although they have positive attitude towards problem solving. The students hold similar predominant beliefs in relation to the three categories of beliefs whether taken as whole or when classified as to gender. The findings also revealed that the students predominantly believed in the usefulness of mathematics in daily life, which ranked first among the three categories of beliefs. They also believed on the importance of word problems in mathematics and this ranked second among the three belief categories. Their perception on the ability to solve time-consuming math problems ranked third.

The results of Pearson Product-Moment Correlation Coefficient test indicated a positive and significant relationship between students' attitude towards and beliefs about problem solving. Another positive and significant relationship was found between students' problem solving performance and attitude towards problem solving. A positive and significant correlation was also found between students' performance in problem solving and the beliefs on the importance of word problems in mathematics and on the usefulness of mathematics in daily life. However, a positive but not significant relationship was revealed between problem solving performance and the belief on the ability to solve time-consuming math problems.

The t-test for mean differences showed that male and female students vary in their performance in solving mathematical problems. On the other hand, non-significant difference was noted in their attitude towards problem solving as revealed by z - test for difference in proportions.

### **Conclusion**

Based on the findings of this study, it can be concluded that the second year high school students do not possess adequate problem solving skills to enable them to solve mathematical problems successfully. It appears that the mathematics curriculum failed to reach its major goal, which is the development of students' problem solving ability. Moreover, it can be concluded that the skills the students acquired in elementary and one year in secondary are not sufficient to enable them to become better problem solvers.

This poor performance of the students can be also traced back to the attitude towards and beliefs they hold about mathematical problem solving. The findings suggest that the stronger the beliefs of the students that they can solve time-consuming math problems, that word problems are important in mathematics and that mathematics is useful in daily life, the more positive their attitude towards problem solving. Results also suggest that the more positive the attitude of the students the better is their performance in this area of mathematics. The findings further imply that the stronger the students' beliefs in the importance of word problems in mathematics and in the usefulness of mathematics in daily life, the higher are the scores in problem solving. The students' beliefs indeed influence their attitude and thus affect their performance in solving mathematical problems.

Male and female students do not vary in their attitude towards problem solving. This implies that one's maleness and femaleness has bearing on attitude. However, the female students performed significantly better than the male students in problem solving solving.

### **Recommendations**

In view of the significant findings of this study, the following are recommended:

1. Development of problem solving skills should be the focus of the math instruction both in elementary and secondary levels.
2. School Curriculum Planners should plan out for teacher training program, which focus on problem solving strategies.
3. Students must be exposed to varied complex word problems. Math problems should have practical applications in students' lives to reinforce problem-solving skills.
4. Teachers in all levels of education should encourage students to develop interest in and liking in mathematics especially in solving mathematical word problems. They should also enjoy mathematics to provide positive experiences for students. Math clubs and other math organizations can be organized and promote activities that encourage members to explore mathematical topics particularly in problem solving. Probably, holding of math quiz contest in school must be given emphasis for students to join in.
5. Teachers should study the set of values and beliefs that every individual bring in school during instruction. They can probably make a survey of students' beliefs at the start of the class.

6. More in-depth studies on students' beliefs with interview as an additional method to be employed in gathering data is encouraged.