

**A COMPARISON OF MATHEMATICAL SKILLS AND NUMERICAL  
PROBLEM SOLVING SKILLS OF G.C.E (A/L) STUDENTS, OFFERING  
CHEMISTRY**

**A PROJECT REPORT PRESENTED BY**

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# **A COMPARISON OF MATHEMATICAL SKILLS AND NUMERICAL PROBLEM SOLVING SKILLS OF G.C.E (A/L) STUDENTS, OFFERING CHEMISTRY**

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Problem solving is an important aspect in science education. The present study focuses on the difficulties faced by the students in numerical problem solving in chemistry at G.C.E. advanced level classes. Students of the G.C.E. (A/L) classes offering chemistry show a general weakness in numerical problem solving. Both subject matter and mathematics play an important role in solving numerical problems. Numerical problem solving is a commonly used tool in evaluating students' achievement in physical chemistry, for example numerical problems play a major role in assessing students' level of performance at the G.C.E. (A/L) Examination. It is therefore important to understand the difficulties students face in numerical problem solving.

The study has been carried out by means of a purpose designed test instrument comprised of two sections viz. "Chemical calculations" section and "Mathematical calculations" section. The aim of the "Mathematical calculations" paper was to assess students' mathematical skills, required to solve the numerical problems in the "Chemical calculations" paper. The Chemical calculations paper was designed to measure the skills of applying subject knowledge (facts and information) to the problem situations and investigate their ability to apply problem solving strategies. The sample with 217 students was selected from 7 schools in Kandy and Matale districts. The sample consists of both male and female students following Physical science and Biological science subject streams. Raw data were converted into percentages and analysed quantitatively. Analysis of variance was used to find out significant differences among gender, stream, group and their interaction. A computer package (Minitab) was used for mean comparisons.

The findings revealed that mathematical skills were really not the obstacle for students to solve numerical problems. However carelessness of handling values of quantities written in scientific notation was seeing a general weakness in reaching the final answer. Many

students have the ability to substitute data into simple key equation. But when the data had to be related to key equations in several steps, most students falter. Application of problem solving strategies is at a very low level.

There is high to very high positive co-relation between achievement in chemistry and numerical problem solving skills. There is positive co-relation between mathematical skills and numerical problem solving skills for all categories but the degree of co-relation was variable. The degree of co-relation was significant for biological science males and females. But the degree of co-relation was low and moderate respectively for physical science females and physical science males. From the analysis using the Anova it can be concluded that there is no significant difference between males and females in the skills of numerical problem solving. Also there is no significant difference between biological and physical science subject streams in numerical problem solving skills for the sample investigated.