



# An Action Research to minimize the problems faced by G.C.E. (A /L) students in performing chemical calculations

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## Abstract

Chemical calculations are used in Chemistry education to enhance the students' ability of applying chemical concepts along with the mathematical concepts to solve problems which involve numerical calculations. However, it has been found that the achievement level of students in chemical calculations at General Certificate of Examination (Advanced Level) is considerably low. As such this action research was aimed at finding the problems faced by the students in chemical calculations and take necessary actions to minimize those problems. Purposive sampling method was used in this study. Questionnaire, pre-tests, assignments, post-tests and participatory observations were used to collect data. Question papers (assignment, pre-test, post-test) were administered to a sample of 27 Grade 12 students selected from one of the National schools in Kalutara District. Quantitative data on students' performance and weaknesses were analyzed through basic statistical procedures. Thematic and content analysis were used to analyze qualitative data. In implementing the intervention programme, group work, application of Technological, Pedagogical and Content Knowledge (TPACK), application of Multidimensional Analysis (MAS) and constructivist approach to learning (inquiry-based learning) were considered. Data gathered through survey reveals that most of the students have difficulties in applying chemical concepts along with the mathematical concepts in Chemical calculations. Findings of the study also indicate that many students haven't properly understood most of the chemical concepts and students have problems in basic mathematical operations. The comparison of the marks of all participants in pre-tests and post tests as the final evaluation were showed remarkable improvement and success the intervention programme. Hence the results of the study suggest that the ways of assessing the students and the existing Chemistry classroom practices need to be re-evaluated with view to use more appropriate teaching, learning and assessing methodologies in order to improve students logical intelligence in Chemical calculations.

**Key Terms:** *Chemical Reaction, Stoichiometry, Chemical Calculations*