PHYSICAL SCIENCE STUDENTS PROFICIENCIES IN SOLVING STOICHIOMETRY PROBLEMS

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Abstract

The aim of this study was to evaluate the problem-solving proficiency of Grade 12 students in Highveld Ridge East and West circuits when solving stoichiometry problems. In these two circuits, there were 1684 male and female students of Black, White, Indian and Coloured from lower, middle and high-income background studying Physical Science in Grade 12. The sample consisted of 61 students that were randomly selected using balls labeled from one to sixty-one from three secondary schools that were randomly selected using balls labeled from one to fifteen. The results of this study revealed that there was low and positive (0.18) correlation between algorithmic and conceptual problem-solving proficiency among the students studied. There were no students with high algorithmic and high conceptual problem-solving proficiency among the students. The majority (96.77%) of students showed low conceptual problem-solving proficiencies. The results also showed that the correct algorithmic solutions were higher than the correct conceptual solutions given by the students. The number of incorrect solutions was, however, higher than the correct solutions. Students had difficulties in interpreting chemical diagrams, and writing a chemical formula. This is an indication that the ability of these students in solving problems relating to chemical equilibrium, acids and bases is likely to be low.

Keywords: Algorithmic problem solving, conceptual problem solving, physical science, stoichiometry.