

ABSTRACT

This study investigated the conceptions and performance of St. Lucian Grade 10 physics students in six categories of electrical phenomena. A national sample of 146 students, or approximately 68% of all Grade 10 students enrolled to do physics, were surveyed. In addition, a six-week intervention based on the heuristics of the Alternative Conceptions Movement's research programme was also administered to a selected sample of 16 physics students to assess changes in performance and distribution of conceptions. A researcher-made instrument and a researcher-designed intervention were utilised. The former was used to elicit the conceptions of a national sample; the latter was used to determine the effect of a teaching model based the principles of the Alternative Conceptions Movement on the performance and distribution of conceptions in the selected sample. The results were analysed using inferential and interpretive, statistical methods. An inferential approach was used to elicit the students' conceptions; interpretive and statistical methods were used to derive the relevant performance indices. The results showed that the students subscribed to a range of conceptions of electrical phenomena and that many of those conceptions could be grouped under broader models with fairly well-defined heuristics. It was also found that those conceptions/models were largely pre-paradigmatic, peripatetic, hybridised or reversed versions of the scientific models. Overall, the national sample had not attained a satisfactory level of performance in the domain. The relationships between age, gender, school attended, students' rating of difficulty of the topic, location (the independent variables) and performance (the dependent variable) were also considered. It was found that (1) the correlations were generally very weak and and mostly insignificant and (2) the independent variables were not good predictors of performance. The results for the national sample and the pre-intervention sub-sample were generally similar; significant changes were, however, found in the post-intervention results. Recommendations included investigation of students' conceptions prior to instruction, establishing a model of scientific thinking resembling the falsificationist criterion of demarcation, and the utilisation of a greater range of classroom techniques.