

## **ABSTRACT**

### **Effects of Combined Instructional Strategies on Selected Jamaican Grade Nine Learners' Conceptions of the Particulate Nature of Matter and Solutions**

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This study was designed to find out if there were any significant (a) differences in the experimental and comparison group students' pretest and posttest knowledge of the particulate nature of matter, and dissolving and solutions, pretest and posttest attitudes to chemistry, pretest and posttest self-esteem; (b) differences in the students' posttest knowledge of the two chemical concepts based on their posttest attitudes to chemistry, posttest self-esteem, cognitive ability in science, treatment, gender and socioeconomic background; and (c) relationships among the students' treatment, posttest attitudes to chemistry, posttest self-esteem, cognitive ability in science, gender, socioeconomic background and their posttest performance on the chemistry test. The main study's sample consisted of 1224 grade 9 students, selected from nine traditional high schools in four parishes. Three instruments which were used to collect the study's data included the Cooper-Smith Self-Esteem Scale (1967), the attitudes towards chemistry questionnaire and the researcher's constructed chemistry achievement test. The results showed that there were significant

differences in the students' (i) pretest (a) knowledge on the two chemical concepts (b) attitudes to chemistry and (c) self-esteem. There were significant differences in the students' (i) posttest (a) knowledge on the two chemical concepts, (b) attitudes to chemistry and (c) self-esteem in favour of the experimental group. There were no significant self-esteem and socioeconomic background differences in the students' posttest performances on the two chemistry concepts; while the male students significantly outscored their female peers in the posttest on the particulate nature of matter test. The students with high posttest attitudes to chemistry and high cognitive ability in science performed significantly better than their counterparts on the two chemical concepts; and the relationship between their posttest attitudes to chemistry, cognitive ability in science and their posttest performance on the two chemistry concepts was positive statistically significant and very strong.

**Keywords:** constructivist teaching strategy; student practical work in groups; teacher demonstration; lecture; knowledge and comprehension of chemical concepts; particulate nature of matter and solutions.