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ABSTRACT

This study evaluated the effectiveness of contrastive and generative teaching strategy in teaching the concepts of the mole, stoichiometry, and molarity among third year high school students. Contrastive and generative teaching strategy refers to those instances in which an unfamiliar domain is made understandable through a more familiar domain during class discussion. This study specifically investigated the change in students’ conceptual understanding, problem-solving abilities, and attitude towards chemistry using paper and pencil tests and interview.

This study made use of quasi-experimental research design involving intact classes, with a total of 98 students, assigned as control group (n = 49) and experimental group (n = 49). The control group underwent traditional lecture method while contrastive and generative teaching strategy was used for the experimental group.

Lawson’s Classroom Test of Scientific Reasoning was used to identify the cognitive level of students selected for case studies in determining attitude change towards chemistry, conceptual understanding, and problem-solving skills. The same test was used to determine to equivalence of the two groups of students in terms of ability to learn the mole concept, stoichiometry, and molarity.

To avoid bias, five parallel lesson plans were developed – one set for the control group and another set of lesson plans for the experimental group. The first three lesson plans pertained to the mole; the last two lesson plans focused on stoichiometry and molarity.

Students’ conceptual understanding and problem-solving performance were assessed both before and after completing the required lessons using assessment tests. The tests were consisting of four types of questions – fixed response multiple-choice, modified multiple-choice, fixed multiple-choice problems, and open-ended problems. On the other hand, students’ attitude towards chemistry were assessed using an attitude questionnaire.

The results indicate that teaching with analogies improved the quality of students’ conceptual understanding and completeness of students’ solutions to the numerical open problems more than traditional teaching, but there was no significant difference in attitude between two groups of students. However, interview transcripts of representative students coming from the experimental group revealed that they like contrastive and generative teaching because it helped them understand and visualize abstract chemistry concepts and ideas. One misconception on stoichiometry was also identified which is not cited in my research literature.