

ANALOGIES, PROBLEM-SOLVING AND CONCEPT MAPPING INSTRUCTIONAL STRATEGIES AS DETERMINANTS OF SENIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN WAVE CONCEPTS IN ADAMAWA STATE, NIGERIA

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ABSTRACT

The declining trends in high school science enrollment present science educators with the need to make informed policy decisions regarding the effectiveness and appropriateness of current instructional approaches. Therefore the effects of the three model-based instructional strategies (analogy, problem-solving and concept mapping) on achievement of High School Physics Students were investigated in this study. These strategies were crossed with two levels of cognitive style and three levels of quantitative ability which served as moderator variables employing a 4x2x3 posttest, control group, quasi-experimental design. Data were collected using three validated and reliable instruments namely: the Cognitive Style Test (CST), the Quantitative Ability Test (QAT) and the Achievement Test in Physics (ATP). Two hundred and forty-three (243) Senior Secondary School 2 students from eight Senior Secondary Schools in Adamawa State, Nigeria took part in the study. Data were analyzed using the Analysis of Variance, Multiple Classification and Scheffe-Post Hoc analysis. The results showed significant effects of the treatments and cognitive styles on achievement. In fact the most effective treatment was the problem solving strategy with the field independent students achieving significantly higher than their field dependent counterparts. These results have implications for improved instructional strategies on students learning of the 'tagged' abstract concept in physics.

KEYWORDS: Abstract Concepts in Physics, Academic Achievement, Cognitive Style, Model-Based Instruction, Quantitative Ability