

**EFFECTS OF GRAPHIC ORGANIZERS ON SENIOR SECONDARY SCHOOL
STUDENTS' ACHIEVEMENT IN ORGANIC CHEMISTRY IN ILORIN METROPOLIS,
NIGERIA**

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DEDICATION

This thesis is dedicated to Almighty Allah (SWT) for his infinite mercy and the noble prophet Muhammed (SAW).

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ABSTRACT

Hydrocarbon has been reported as one major topic in organic chemistry that students find difficult to learn due to poor understanding of the concepts. Studies have suggested the use of graphic organizers as possible strategies for reducing this difficulty. Therefore, the objectives of this study were to determine the: (i) effect of concept map graphic organizer on students' achievement in hydrocarbon; (ii) effect of mind map graphic organizer on students' achievement in hydrocarbon; (iii) comparative effect of students' achievement when taught with concept map organizers and with mind map organizers; (iv) perception of students on the use of concept map and mind map organizers; (v) experience of students when using concept map and mind map organizers; (vi) achievement of students' taught using concept map and mind map organizers based on gender; and (vii) achievement of students' taught organic chemistry using concept map and mind map organizers based on their cognitive styles.

Mixed-method research involving an explanatory-sequential research design which required triangulation using data convergence model was adopted for this study. The sample for this study involved 183 senior school chemistry students who were purposively selected. Seven research instruments were utilized: two researcher-designed concept map and mind map graphic organizers; an adopted cognitive style instrument; interview protocol; chemistry achievement test (CAT); and, two adapted questionnaires on graphic organizers: Students' Perception on the use of Concept Map (SPCM) and Students' Perception on the use of Mind Map (SPMM). The reliability coefficient of CAT, SPCM and SPMM were 0.74, 0.83 and 0.85 respectively. Quantitative data were analyzed using *t*-test and Analysis of Covariance (ANCOVA) while qualitative data were analyzed thematically.

The findings of the study were that;

- i. students' taught hydrocarbon with concept map graphic organizer performed better than their counterparts taught with conventional method. ($F_{(1,136)} = 10.37, p < .05$);
- ii. students' taught hydrocarbon with mind map graphic organizer had better achievement than those taught with conventional method. ($F_{(1,103)} = 28.17, p < .05$);
- iii. the achievement of students' taught hydrocarbon with mind map were better than those taught with concept map organizer. ($F_{(1,118)} = 7.04, p < .05$);
- iv. the mean for perceived usefulness of graphic organizers in learning hydrocarbon was moderately high ($\bar{x} = 3.19$) with 92% of the students having a scale score of 2.54-3.50;
- v. 80% and 90% of the students' reported that concept map and mind map organizers enhanced their learning of hydrocarbon respectively;
- vi. Gender has no significant difference in students' achievement in hydrocarbon when taught with either of the graphic organizers; and
- vii. no significant difference exist in students' achievement in hydrocarbon when taught with either graphic organizers based on their cognitive styles.

The study concluded that, irrespective of gender and cognitive style, graphic organizers improved students' achievement in hydrocarbon. Also, the achievement of students taught with mind map graphic organizer was better than their counterparts with concept maps. The implication of this is that graphic organizers are effective teaching/learning strategies in organic chemistry. The study

recommended among others that chemistry teachers should incorporate the use of graphic organizers in teaching difficult concepts in organic chemistry.

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