

**EFFECTS OF COMPUTER-BASED MAPPING STRATEGIES ON SENIOR
SCHOOL STUDENTS' ACHIEVEMENT AND INTEREST IN
CHEMISTRY IN ILORIN, NIGERIA**

Ph.D. ORAL DEFENCE

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CERTIFICATION

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DEDICATION

This research is dedicated to God Almighty, the giver of wisdom, knowledge and understanding.

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ABSTRACT

Chemistry has been perceived as a difficult subject to learn by students. Researchers have identified factors responsible for students' under-achievement in Chemistry as inappropriate instructional method and students' lack of interest. Therefore, the objectives of this study were to: (i) determine the difference in the achievement of students taught Chemistry using Computer-based Concept Mapping (CCM), Computer-based Mind Mapping (CMM) and conventional method; (ii) establish the effects of CCM and CMM on students' interest in Chemistry; (iii) investigate the effects of CCM and CMM on the students' achievement and interest based on gender; (iv) explore the effects of CCM and CMM on the achievement and interest of students based on score level; (v) determine the effects of CCM and CMM on the achievement and interest of students based on learning style; and (vi) investigate the interaction effects of treatments on: gender; score level; and learning style on students' achievement and interest.

A quasi-experimental, non-randomized, non-equivalent pre-test, post-test control group design was adopted. The population for the study was all Senior School students offering Chemistry in Ilorin, while the target population was all Senior School II students offering chemistry. The sample size was 239, consisting of three intact classes of SS2 assigned to two experimental groups and a control group. The instructional packages used were Computer-based Concept Mapping Instructional Package and Computer-based Mind Mapping Instructional Package. The test instruments used were Chemistry Achievement Test on Rate of Reactions (CATOROR), Chemistry Interest Scale (CIS) and Visual, Auditory and Kinesthetic Learning Style Test (VLST). The instruments were validated by experts in science education, educational technology and chemistry. The reliability coefficients of CATOROR, CIS and VLST were found to be 0.69, 0.73 and 0.81 respectively. Analysis of Covariance was used to test the hypotheses at .05 level of significance and Bonferroni for *post hoc* analysis.

The findings of the study were that:

- i. significant effects of CCM and CMM existed on students' achievement in favour of CMM group ($F_{(2, 235)} = 42.75, p < .05$);
- ii. significant effects of CCM and CMM existed on student's interest in favour of CCM group ($F_{(2, 235)} = 12.06, p < .05$);
- iii. no significant effects of CCM and CMM on students' achievement and interest based on gender;
- iv. no significant effects of CCM and CMM on students' achievement and interest respectively based on score levels and learning styles;
- v. significant effect of CCM and CMM existed on students' interest and achievement respectively based on learning styles ($F_{(2, 91)} = 4.46, p < .05$, $F_{(2, 57)} = 5.18, p < .05$) in favour of visual and kinesthetic learners; and
- vi. no significant interaction effects of treatments existed with gender, score levels and learning styles on student's achievement and interest in Chemistry.

The study concluded that mapping strategies enhanced students' achievement and interest in Chemistry. This implies that students perform better and their interest enhanced in Chemistry

using CCM and CMM. The study recommended that CCM and CMM should be adopted for teaching Chemistry in Nigerian Senior Schools.

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