

Effect of Model Based Inquiry on Achievement and Critical Thinking of College Pre-Service Chemistry Teachers

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ABSTRACT

Purpose – This study reports on the outcome of an investigative inquiry approach - Model Based Inquiry (MBI) on achievement and critical thinking of college pre-service chemistry teachers.

Methodology – Anchored on Constructivism, the study employed quasi experimental (non-equivalent control group) design. A total of 174 level 200 college pre-service chemistry teachers from two State Colleges of Education (SCOEs) in North West geo-political zone of Nigeria in their intact classes were involved in the study. The experimental group (N = 70, College of Education, Maru) was taught CHEM 221 using Model Based Inquiry and control group (N = 104, Isa Kaita College of Education) was taught the same course with Conventional Inquiry (CI) approach. The treatment covered a period of ten weeks. A 60-item Chemistry Achievement Test (CAT) and a 22-item Test of Critical Thinking (TOCT) were used as instruments for data collection. The TOCT consists of two sections A and B. Section A has 7 items assessed by adapting Luft (1997) rubric scoring guide while Watson and Glaser (2002) format was adopted for section B.

Findings – Although inquiry approaches have proved to be positive in science instructions, the finding of this study showed a significant difference in achievement and critical thinking skills acquisition in favor of pre-service chemistry teachers taught with MBI instructional technique. This implies that beside the students' interactive opportunities in both (CI & MBI) approaches, the modeling activities and deep subject matter understanding in MBI provide more opportunity in achievement and the ability to analyze situations, evaluate and interpret relationships to the prospective teachers in experimental group than in control.

Significance – Adopting MBI at pre-service teachers' level may enable prospective teachers respond to changes in economic and social conditions for success in their science classrooms and personal lives in line with the recommendations of National Commission for Colleges of Education (NCCE).

Keywords: Model based Inquiry, Conventional Inquiry, Achievement and Critical Thinking