

# CAUSAL PATHS AND DIRECTIONS OF THRESHOLD TIME AMONG INTEGRATED SCIENCE TEACHERS IN DELTA STATE

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## Abstract

There are indications that the amount and quality of science teaching and learning that take place in schools are mediated by teacher-related factors. Notable among them is the nature of teacher-pupil interactions that take place in the classroom. This study is designed to investigate the causal paths and directions of threshold time among integrated science teachers in Delta state, Nigeria. An ex-post facto design was adopted by hypothesizing a theoretical causal relationship model. The sample consisted of all 147 qualified integrated science teachers in the 25 local government areas in Delta state. Intact classes of students were purposively sampled and taught by the integrated science teachers. Five instruments were used in the study. They are the Classroom Interaction Sheet (CIS), Teachers' Attitude Towards Integrated Science Teaching Questionnaire (TATISTQ), Locus of Control Scale (LCS), Self-concept Rating Scale (SCRS) and Sigel's Cognitive Style Test (SICOST). Data was collected in two phases. During the first phase, classroom observation of the teaching process using the CIS was done and recorded at fifteen seconds interval across all categories while in the second and third phases, TATISTQ, LCS, SCRS and SICOST were administered on the teachers. Data collected were analysed using time-series analysis of frequency and cumulative frequencies across the different behaviour categories of the CIS. The mean of the threshold time and its associated standard deviation were calculated. Data generated from the questionnaires were analysed using multiple regression on the 8-teacher factors. A parsimonious model was produced with sixteen surviving paths at 0.05 level of significance. This model explained the pattern of correlation of the causal interaction between the predictor and the criterion variables. The study also found 27 out of the 136 pathways through which the predictor variables caused variation in the criterion variable as significant. The study recommended that integrated science teachers should be exposed to the knowledge and benefits of threshold time through teacher education and in-service courses to enable them manage instructional time.

Keywords: Innovation, technology, research projects.

## 1 INTRODUCTION

The need for effective science teaching and learning in schools made the United Nations Educational, Scientific and Cultural Organization (UNESCO) to organize the first "International Conference on the use of Integrated Approach to Science Teaching" in 1968. Others followed in Maryland, (USA) in become sensitive to the need to use integrated approach in science teaching through the Science Teachers Association of Nigeria (STAN) Curriculum Newsletter No.1 in 1970, which contained a statement of the Philosophy, Methodology, Content and Evaluation of Integrated Science.

There are indications that the amount and quality of science teaching, Integrated Science teaching inclusive, that take place in schools are associated with teacher factors such as qualification [1], teaching experience [2], attitude toward science teaching [3],[4], gender [5], locus of control [6] and Cognitive style [4]. The teacher that interprets the science curriculum, thus making it possible for the planned educational objectives to be realized [6], [7],[8] found that classroom climate is a significant factor in pupils' achievement

Two approaches were used by early researchers for the observation of classroom interaction patterns: namely, the category system [9],[10],[7] and the sign system [11],[12]. The category and sign systems were combined in the instrument called "Observation Schedule Record" (OSCAR) [13] by modifying identified certain patterns associated with pupil attitude to learning, one of which is that the teacher was fully in charge in most classrooms, using his authority to control classroom activities and restrict student participation.