

Differentials in Student Academic Achievement: A Hierarchical Linear Modelling of Primary School Effects in Mumias and Kuria East Sub-Counties, Kenya

Epari, Charles Ejakait

Abstract

Spurred by the Coleman Report of 1966 on the Equality of Educational Opportunity in the US, the past five decades have seen rapid expansion in academic achievement surveys albeit fraught with mixed findings and interpretation. Utilizing the education production function models, the surveys sought to test whether school or teacher-level variables explained more academic achievement variance than did student-level variables. Within this framework, this study examined the effect of primary school level variables on student academic achievement in Mumias and Kuria East Sub Counties. Despite heavy resource allocation to public primary schools under the Free Primary Education policy in terms of financial, human, material and capital inputs, student academic achievement in these schools has remained low compared with that in private primary schools. The study examined the effect of teacher-level variables, non-teacher school-level resource input variables and school-level aggregate variables on student academic achievement in the Kenya Certificate of Primary Education (KCPE) examination. Mumias and Kuria East Sub-Counties were randomly sampled from the top and bottom five percent Sub-Counties on a merit list of KCPE results for 2010-2012 respectively. Using the ex-post-facto research design, stratified random sampling using probability proportion to size was used to draw 1824 Class 8 students in 61 primary schools from target populations of 6120 and 161 respectively. Sixty-one head teachers and 305 teachers of Class 8 were purposively drawn from the sampled schools. Supervisors validated the instruments and the inter-item reliability correlation coefficient was 0.812, 0.793 and 0.778 for the school, teacher, and student questionnaires respectively after piloting in four schools, one public and one private in each of the Sub-Counties. Using Hierarchical Linear Modelling, teacher-level variables explained 1.05% of the 49.29% variance explained in Objective 1. A Likelihood Ratio (LR) test for this value ($\chi^2 = 24, p < .001$) suggested sufficient evidence to reject the null hypothesis that the teacher-level variables in the final Model had no statistically significant effect on student academic achievement. Under Objective 2, the non-teacher school-level resource inputs explained 2.71% of the 58.07% variance explained. A LR test for this value ($\chi^2 = 42, p < .001$) suggested sufficient evidence to reject the null hypothesis that these inputs had no statistically significant effect on student academic achievement in the KCPE examination at $\alpha .05$. Under Objective 3, other school-level variables explained 49.31% of the 63.67% variance explained. A LR test for this value ($\chi^2 = 122, p < .001$) suggested that there was sufficient evidence to reject the null hypothesis that these variables had no statistically significant effect on students' KCPE scores. The conclusion is that school-level variables accounted for much of the variation in student

academic achievement than did student or teacher. It is recommended that strong mentorship programmes for female students be initiated to improve their academic achievement. Day schools should maximally utilize their time while students should be allowed to borrow school and library books and other learning materials for private study during their free time away from school.

Keywords: Differentials, Student Academic Achievement, Hierarchical Linear, Modelling, Primary School, Mumias, Kuria East Sub-Counties, Kenya