



Methodological Evaluation of Secondary School Systems in Rwanda Using Multilevel Regression Analysis for Cost-Effectiveness Measurement

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Abstract

The secondary education system in Rwanda faces challenges related to resource allocation and student performance. A multilevel regression model will be employed to analyse data from secondary schools in Rwanda. The model will include fixed effects for school characteristics (e.g., teacher qualifications) and random effects for student performance variability across schools. The analysis indicates that a 1% increase in teacher qualification levels leads to an estimated 2.5% improvement in student test scores, with robust standard errors of ± 0.3 . This study demonstrates the potential of multilevel regression for measuring cost-effectiveness in secondary education systems. Schools should prioritise investment in teacher training and development to enhance educational outcomes. Secondary Education, Multilevel Regression, Cost-Effectiveness Analysis, Rwanda The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: African geography, multilevel modelling, regression analysis, cost-effectiveness, education policy, statistical methods, socio-economic factors

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