African Theoretical Physics (Pure Science)

Methodological Evaluation of Secondary School Systems in Uganda: Panel Data Estimation for Adoption Rates

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Abstract

Secondary education systems in Uganda are undergoing reforms aimed at improving student performance in Physics, a core subject for university entrance. However, little is known about how these systems are being adopted and what factors influence their effectiveness. A fixed effects model was applied to a dataset comprising 50 secondary schools over three academic years. Variables included school characteristics, student performance metrics, and government intervention measures. Robust standard errors were used for inference. The analysis revealed that the average adoption rate of new Physics curricula across all schools was 62%, with significant variation between urban and rural regions. This study provides insights into how secondary school systems are being adopted in Uganda, offering a nuanced understanding of policy impacts on Physics education outcomes. Future research should explore the long-term effects of these reforms and consider implementing additional support measures for less adoptive schools. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, panel data analysis, econometrics, educational reform, physics education, quantitative methods, statistical inference*

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