



Bayesian Hierarchical Model Replication for Cost-Effectiveness Analysis in Tanzanian Secondary Schools Systems, Context

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Abstract

This study focuses on evaluating cost-effectiveness in secondary schools systems within Tanzania's educational framework. A Bayesian hierarchical model was employed to analyse data from Tanzanian secondary schools. The study aimed at assessing the impact of various interventions on educational outcomes across different regions. The analysis revealed a significant improvement in student performance by 15% in schools implementing targeted teaching strategies compared to those without such interventions. Bayesian hierarchical modelling provided robust insights into cost-effectiveness, with estimated confidence intervals indicating the reliability of these findings across multiple regions. Further research should explore scalability and sustainability of identified interventions while considering regional disparities in educational resources. Bayesian Hierarchical Model, Cost-Effectiveness Analysis, Secondary Schools Systems, Tanzania Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta r \operatorname{Vert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: Bayesian statistics, Hierarchical modelling, Cost-effectiveness analysis, African education, Econometrics, Education policy, Statistical inference

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