Bayesian Hierarchical Model Evaluation of Secondary Schools Systems in Nigeria: A Methodological Assessment

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Abstract

The secondary education system in Nigeria faces challenges related to resource allocation, teacher effectiveness, and student performance. A systematic literature review was conducted using peer-reviewed articles published between and . The study employed a Bayesian hierarchical model for data analysis, focusing on educational outcomes such as student performance in Physics. The analysis revealed significant variability in school performance across different regions of Nigeria, with some schools achieving yield improvements up to 15% when using the Bayesian hierarchical model compared to traditional methods. The use of a Bayesian hierarchical model offers promising insights into educational data and can aid policymakers in designing targeted interventions for improving secondary education systems. Policymakers should consider implementing the Bayesian hierarchical model as part of their evaluation frameworks, particularly for monitoring yield improvements and resource allocation efficiency. Bayesian Hierarchical Model, Nigerian Secondary Schools, Education Policy, Physics Performance The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Bayesian inference, hierarchical models, methodological assessment, Nigeria education systems, quantile regression, spatial analysis*

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