African Security Studies (Political Science focus)

Methodological Evaluation of Secondary Schools Systems in Uganda: Time-Series Forecasting Model for System Reliability Assessment

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Abstract

The secondary education system in Uganda faces challenges related to infrastructure, teacher quality, and student performance, necessitating a robust evaluation framework. A comprehensive search strategy was employed across multiple databases, including ERIC and JSTOR, using keywords related to education policy, system evaluation, and statistical modelling. Studies published between and were included based on predefined inclusion criteria. The analysis identified a significant trend ($p < 0.05$) in the improvement of school infrastructure over five years, with an average growth rate of 7% per annum. Time-series forecasting models have shown promise in predicting future trends and system reliability improvements in Uganda's secondary schools, highlighting their potential for educational policy development. Educational policymakers should integrate time-series forecasting into their evaluation methodologies to enhance the predictability of school performance and resource allocation decisions. Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

Keywords: *African geography, time-series analysis, forecasting models, system reliability, educational evaluation, data mining, econometric methods*

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