



Methodological Evaluation of Ghana's Secondary School Systems: A Randomized Field Trial on System Reliability

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Abstract

The secondary school system in Ghana is a critical component of its education infrastructure, aiming to equip students with essential knowledge and skills for further studies or employment. However, there is limited empirical research on the reliability and stability of this educational framework. A mixed-methods approach was employed, integrating both quantitative data collection (via standardised tests) and qualitative assessments (through interviews with educators and students). Randomization techniques were used to ensure fair representation across different schools and regions. Statistical models were applied to analyse the reliability of educational outcomes. The findings suggest a moderate level of system reliability in terms of academic performance, although variability exists between urban and rural settings. Specific themes identified include disparities in resource allocation, teacher training effectiveness, and student engagement strategies. This study provides valuable insights into the reliability of Ghana's secondary school systems through rigorous methodological evaluation. The results highlight areas requiring further attention to enhance educational equity and quality. Based on these findings, recommendations include targeted interventions for resource allocation in underserved regions, improved teacher training programmes, and enhanced student engagement strategies. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, stratified sampling, randomized trials, validity assessment, reliability analysis, educational efficacy, data triangulation*

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