



Methodological Evaluation of Secondary Schools Systems in Kenya: Estimating Efficiency Gains Using Panel Data Analysis

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Abstract

The secondary education sector in Kenya faces challenges related to resource allocation and operational efficiency. A mixed-methods approach combining quantitative (panel-data estimation) and qualitative analyses was employed. Panel Data Analysis (PDA) with a random effects model was used for efficiency gains assessment. Panel Data Analysis revealed average efficiency scores of 75% across sampled schools, indicating significant room for improvement in resource utilization. The study highlights the need for targeted interventions to enhance school performance and resource management. Schools should prioritise resource allocation based on student needs and adopt flexible scheduling models to improve operational efficiency. The empirical specification follows $Y = \beta_{0+\beta} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African education, panel data, mixed methods, educational efficiency, resource allocation, quantitative analysis, qualitative inquiry*

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