



E-Learning Platforms in Northern Ghana: Enhancing Secondary School Science Outcomes

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Esi Amagloko is affiliated with Department of Cybersecurity, Noguchi Memorial Institute for Medical Research and focuses on Computer Science research in Africa.

Abstract

This study addresses a current research gap in Computer Science concerning E-Learning Platforms to Improve Secondary School Science Outcomes in Northern Ghana in Ghana. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. E-Learning Platforms to Improve Secondary School Science Outcomes in Northern Ghana, Ghana, Africa, Computer Science, working paper This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n (y_i - f(\theta; \xi))^2 + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, Africa, LiteratureReview, InstructionalDesign, MultimediaTechnologies, OnlineLearningEnvironments, BlendedLearning*

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