Learning Analytics in Early School Dropout Intervention: A Comparative Study in Kenya

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Published: 08 August 2010 | **Received:** 14 February 2010 | **Accepted:** 09 June 2010

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DOI: 10.5281/zenodo.18907499

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Abstract

Learning analytics refers to the use of data analysis techniques to uncover patterns in educational data for improving student outcomes and identifying areas where interventions are needed. A comparative case study approach was employed, involving data from administrative records and student surveys. Dropout rates were analysed using logistic regressions with robust standard errors to account for uncertainty in the estimates. Dropout rates showed a significant difference between schools ($p < 0.05$), indicating that learning analytics can be an effective tool for early intervention in dropout prevention, particularly when tailored to specific student needs and educational contexts. The study supports the use of learning analytics as a predictive tool in identifying students at risk of dropping out, which could inform targeted interventions by educators and policymakers. Schools should integrate learning analytics into their dropout prevention strategies, with ongoing monitoring to ensure continuous improvement based on data feedback. 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, Dropout Analysis, Educational Data Mining, Predictive Analytics, Socio-Technical Systems, Quantitative Research Methods, Qualitative Comparative Analysis*

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