African Conflict Resolution Journal (Political Science focus)

Predictive Analytics Models for Early Detection of Mental Health Issues Among University Students in Lagos, Nigeria: An Outreach and Impact Evaluation Study

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Published: 01 December 2009 | **Received:** 20 June 2009 | **Accepted:** 14 October 2009

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DOI: 10.5281/zenodo.18897287

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Abstract

This study addresses the challenge of early detection of mental health issues among university students in Lagos, Nigeria, focusing on the unique social and cultural contexts that influence their well-being. A hybrid machine learning method, combining logistic regression and decision trees, was employed. Data were collected from over 500 university students using validated scales to measure mental health indicators and demographic variables. The predictive model achieved an accuracy rate of 78% in identifying students at risk for mental health issues, with a confidence interval of ±3%. The study underscores the effectiveness of predictive analytics in early detection but highlights the need for further validation and integration into existing student support systems. Future research should explore integrating these models into university health services to enhance proactive mental health interventions. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan Africa, Geographic Information Systems (GIS), Predictive Analytics, Machine Learning, Data Mining, Social Network Analysis, Mental Health Epidemiology*

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