



Adapting VR Simulations for Basic Engineering Concepts in Kenyan Rural Schools Educación Tecnológica Integrada en Escuelas Rurales de Kenia Usando Simulaciones Virtuales de Realidad Virtual Para la Enseñanza de Conceptos Básicos de Ingeniería

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Abstract

Virtual Reality (VR) simulations have shown promise in enhancing learning outcomes for basic engineering concepts among students globally. A mixed-methods approach was employed, including pre- and post-tests with Likert scales for quantitative data collection, and interviews for qualitative insights. The sample size consisted of 120 students from four selected rural schools in Kenya. Students demonstrated a significant improvement ($p < 0.05$) in understanding basic engineering concepts after exposure to VR simulations compared to pre-test scores. Adapting VR simulations for Kenyan rural schools has the potential to bridge the digital divide and enhance STEM education outcomes. Further research should be conducted to evaluate long-term impact and scalability of this approach in diverse educational contexts. The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Virtual Reality, Mixed Methods, Engineering Education, Rural Schools, VR Simulations, Geographical Focus, Technological Integration*

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