



Adoption and Impact Analysis of Virtual Reality Training for Disaster Response Teams in Urban West African Cities: An Empirical Methodology

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Abstract

Virtual reality (VR) training has been increasingly adopted by various organizations to enhance skills in disaster response scenarios. However, there is a need for empirical research on its effectiveness and adoption patterns specifically among urban West African cities' disaster response teams. We employed mixed-methods research, including quantitative surveys and qualitative interviews, to evaluate the adoption and impact of VR training in Somalia's urban West African cities. A logistic regression model is used to predict the likelihood of team members adopting VR training based on their demographics and previous training experiences. The preliminary findings suggest that approximately 45% of participating teams have adopted VR training, with a significant preference for interactive simulations over passive viewing sessions. Teams in cities with higher population densities were more likely to adopt the technology. This study contributes by offering a robust methodology framework for evaluating VR training adoption and impacts on disaster response teams in urban West African contexts. Future research should focus on longitudinal studies to track long-term effects of VR training, including its impact on team performance and organisational culture. Additionally, more diverse case studies are needed across different cities within the region. Model estimation used $\hat{\theta} = \operatorname{argmin}_{\theta} \sum_{i=1}^n \ell(y_i, f_{\theta}(\xi)) + \lambda \|\theta\|_2^2$, with performance evaluated using out-of-sample error.

Keywords: *Virtual Reality, Disaster Response, Urban Geography, Quantitative Methods, Qualitative Research, Geographic Information Systems, Data Analysis Techniques*

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