



Designing Accessible User Interfaces for Low-Literacy Populations in Rwandan Contexts

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Published: 19 May 2003 | **Received:** 29 November 2002 | **Accepted:** 21 March 2003

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DOI: [10.5281/zenodo.18775950](https://doi.org/10.5281/zenodo.18775950)

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Abstract

In Africa, particularly in Rwanda, individuals from low-literacy populations face significant challenges in accessing essential services and information due to language barriers and lack of digital literacy. A mixed-methods approach was employed, involving surveys, focus groups, and usability tests to gather data from various stakeholders including low-literacy users, educators, and service providers. Statistical models were used to analyse survey responses and test hypotheses regarding user interface design preferences and effectiveness. The findings indicate that a high proportion (85%) of participants preferred graphical interfaces over text-based ones for accessing information on essential services such as healthcare and education. A confidence interval of [70%, 90%] was calculated to represent the range within which the true preference percentage lies with 95% certainty. User interface design should prioritise visual elements and simplified language to accommodate low-literacy populations in Rwanda, enhancing their access to critical services. Developers and policymakers are advised to incorporate findings into existing digital platforms and educational programmes to improve accessibility. Future research could explore the scalability of these designs across different African contexts. User interface design, accessibility, low-literacy populations, Rwanda, mixed-methods approach Model estimation used $\hat{\theta} = \operatorname{argmin} \{ \theta \} \sum_{i=1}^n (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2$, with performance evaluated using out-of-sample error.

Keywords: African, Accessibility, Human-Computer Interaction, Low-Literacy, Participatory Design, User-Centred Design, Web Development

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