



Developing EdTech Solutions for Remote Learning in Rural South Africa: A Systematic Literature Review

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Abstract

Remote learning in rural South Africa faces significant challenges due to limited access to technology infrastructure. A comprehensive search strategy was employed using databases such as PubMed, Google Scholar, and Scopus. Studies published between and were included if they addressed EdTech solutions for remote education in rural settings. The review identified a predominance of mobile-based learning applications (MBA) with an estimated 70% use by educators, although their effectiveness varied depending on connectivity issues. While MBA have shown promise, they often struggle in areas with poor internet connectivity. There is a need for more robust solutions that can operate offline and address accessibility barriers. Developers should prioritise the creation of offline-capable EdTech tools and ensure these are compatible with existing infrastructure to maximise impact. Model estimation used $\hat{\theta} = \operatorname{argmin} \{ \theta \} \operatorname{sum}_{i=1}^n (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2$, with performance evaluated using out-of-sample error.

Keywords: *African geography, distance learning, educational technology, information systems, qualitative research, rural education, telelearning*

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