

## A critical study of adapting techno-pedagogy for rural school classrooms

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The rapid digital transformation of education has disproportionately benefited urban schools, leaving rural institutions in developing nations struggling with systemic challenges in adopting techno-pedagogical approaches. This study critically examines the adaptation of technology-enhanced pedagogy in rural schools in Sri Lanka and India, focusing on infrastructural limitations, teacher readiness, and barriers to student engagement. Despite government initiatives like India's DIKSHA platform and Sri Lanka's Nenas TV, DAN Tamil, and Nethra programmes, rural classrooms continue to face persistent disparities. Only 27% of rural Indian households have internet access, and only 34% of schools possess functional computers. Teacher preparedness remains a critical bottleneck, with just 28% of Sri Lankan rural educators confident in using digital tools. Through comparative case studies, the research evaluates successful models, including Kerala's localized DIKSHA implementation (with 80% teacher adoption) and Sri Lanka's e-Thaksalawa offline digital libraries, demonstrating that context-specific, low-tech solutions often outperform high-cost, connectivity-dependent systems. The study reveals that passive content delivery models, such as television-based lessons, achieve limited engagement (only 34% student interaction), while interactive, vernacular solutions like India's SMS-based "Tara" chatbot significantly enhance learning outcomes (68% improvement). Hybrid approaches combining radio broadcasts, mobile technology, and community involvement prove most effective, particularly for marginalized groups—girls showed 23% greater gains from mobile learning. These findings challenge dominant frameworks, such as SAMR and TPACK, which prioritize technological sophistication over accessibility and advocate for "frugal innovation" tailored to rural realities. Policy recommendations emphasize (1) offline-first digital infrastructure, (2) continuous teacher training with localized pedagogical support, and (3) community-embedded implementation to ensure sustainability. The study highlights the importance of equity-focused interventions, advocating for a paradigm shift from top-down technological deployment to participatory, context-driven models. Future research directions include longitudinal studies on programme sustainability and cost-benefit analyses of hybrid learning systems. By bridging the gap between policy ambitions and grassroots realities, this research contributes an actionable roadmap for inclusive digital education in low-resource settings.

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