Blended Learning For Standard Syllabus Delivery In Low-Resource Higher Education: Practitioner Insights From Arunachal Pradesh

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Abstract: Higher education institutions in Arunachal Pradesh face persistent challenges in delivering standard undergraduate syllabi due to unreliable electricity supply, limited digital infrastructure, difficult terrain, and dispersed student populations. While national policies increasingly promote technology-enabled learning, such models often fail to account for the realities of low-resource educational environments. This paper presents a practitioner-based reflective study of a low-cost blended learning framework implemented over two academic years across multiple colleges in Arunachal Pradesh. The framework integrates face-to-face instruction using blackboard-based visual scaffolding with asynchronous reinforcement through WhatsApp and peer-generated learning artifacts. Using reflective classroom observation and teaching documentation, the study analyses how instructional continuity, student participation, and inclusivity were sustained during recurring infrastructural disruptions. The findings demonstrate that blended learning, when redefined through low-technology and context-sensitive tools, functions as a resilience mechanism rather than a technology-intensive intervention. The study offers a practical and scalable model aligned with the objectives of the National Education Policy (NEP) 2020 for higher education institutions operating under severe infrastructural constraints.

Keywords - Blended Learning, Low-Resource Pedagogy, WhatsApp-Based Learning, Arunachal Pradesh, Digital Divide, NEP 2020

I. INTRODUCTION

Delivering standard undergraduate syllabus content in Arunachal Pradesh presents a distinct set of structural, environmental, and infrastructural challenges that significantly affect teaching-learning processes. Frequent power outages, limited access to digital devices, unstable mobile network connectivity, and long travel distances for students routinely disrupt classroom instruction. Unlike urban higher education institutions that are supported by smart classrooms, learning management systems, and uninterrupted internet access, colleges in this region operate within conditions of persistent technological uncertainty. Despite these constraints, faculty members are required to complete prescribed syllabi within fixed academic calendars and comply with assessment schedules mandated by affiliating universities.

This creates a critical gap between policy-level expectations and classroom-level realities. Traditional face-to-face teaching methods alone often prove insufficient when instructional time is repeatedly lost due to power failures, monsoon-related road blockages, or institutional resource limitations. In such contexts, blended learning cannot be understood as a technology-heavy instructional model. Instead, it must be reconceptualized as a flexible pedagogical strategy that integrates available physical and digital resources to ensure continuity of learning. This paper argues that blended learning, when adapted to local conditions, becomes a functional necessity rather than an optional pedagogical enhancement. The study documents and analyses a practitioner-developed blended learning framework implemented in Arunachal Pradesh, with a focus on its conceptual logic, execution, and observed outcomes.

II. LITERATURE REVIEW AND THEORETICAL CONTEXT

2.1 Blended Learning in Higher Education

Blended learning is commonly defined as an instructional approach that combines face-to-face teaching with technology-mediated learning activities. Existing research suggests that blended learning can enhance learner engagement, flexibility, and instructional continuity. However, much of the literature is situated in well-resourced institutional contexts where stable electricity, high-speed internet, and advanced digital platforms are readily available. As a result, the direct applicability of these models to rural and remote regions remains limited.

2.2 The Digital Divide in Rural and Remote India

The digital divide extends beyond access to devices and internet connectivity to include disparities in digital literacy, institutional readiness, and infrastructural reliability. Higher education institutions in Arunachal Pradesh experience a compounded digital divide characterized by hardware scarcity, frequent power disruptions, and inconsistent mobile data services. Under such conditions, conventional e-learning platforms and high-bandwidth instructional tools become impractical, necessitating alternative low-technology pedagogical approaches.

2.3 Context-Sensitive and Low-Tech Pedagogy

Recent pedagogical discourse emphasizes the importance of contextual adaptation in instructional design. Low-tech pedagogy focuses on maximizing learning outcomes through minimal technological intervention, particularly in resource-constrained environments. Widely accessible mobile applications such as WhatsApp have increasingly been used as informal learning spaces due to their low data consumption, asynchronous functionality, and familiarity among students in rural contexts.

III. METHODOLOGY

The study adopts a qualitative practitioner-reflection methodology based on over two academic years of undergraduate teaching experience across multiple colleges in Arunachal Pradesh. The blended learning framework was implemented, observed, and refined during regular classroom teaching under real-world institutional constraints.

Data sources included reflective teaching notes, classroom observations, records of WhatsApp-based academic interactions, student-submitted handwritten learning artifacts, and informal student feedback. The study does not attempt experimental measurement of learning outcomes; instead, it focuses on process-oriented indicators such as syllabus completion, continuity of instruction, participation patterns, and inclusivity. This approach is appropriate for exploratory pedagogical research situated within authentic classroom environments.

IV. Blended Learning Framework Adopted

The blended learning framework developed for this study consists of a three-layer pedagogical model designed to function effectively under conditions of infrastructural instability.

4.1 Core Delivery: Blackboard-Based Visual Scaffolding

Face-to-face instruction formed the foundational layer of the framework. Due to frequent projector failure and power instability, the blackboard was intentionally retained as the primary instructional medium. Complex theoretical concepts were incrementally developed through structured diagrams, flowcharts, and stepwise visual representations constructed during classroom sessions.

This visual scaffolding approach enabled students to actively build comprehensive written records of the syllabus in their notebooks. As learning did not depend on digital access, students without smartphones or consistent connectivity were not excluded from core content delivery.

4.2 Asynchronous Digital Reinforcement through WhatsApp

The second layer addressed instructional interruptions caused by shortened class durations and student absenteeism. WhatsApp was used as an asynchronous reinforcement tool rather than as a substitute for classroom teaching. Following each lecture, a concise micro-summary highlighting key concepts and learning objectives was shared in the class group.

This practice provided continuity for absent students and allowed for asynchronous doubt clarification. WhatsApp's low bandwidth requirements and compatibility with basic smartphones made it the most inclusive digital platform for the student population.

4.3 Peer Collaboration and Learning Artifact Sharing

The third layer emphasized active learning and peer engagement. Students were assigned tasks requiring them to create hand-drawn concept maps linking different units of the syllabus. Photographs of these learning artifacts were shared in the WhatsApp group, enabling peer observation and informal feedback.

This process encouraged cognitive processing, synthesis of content, and collaborative learning, while also sustaining academic interaction during periods of classroom disruption.

V. RESULT AND DISCUSSION

5.1 Continuity of Syllabus Delivery

The most significant outcome observed was the maintenance of syllabus momentum despite infrastructural disruptions. Power outages or weather-related interruptions did not result in prolonged instructional gaps, as students continued engaging with shared materials and discussions asynchronously. This eliminated lecture backlog and ensured timely completion of prescribed syllabus units.

5.2 Inclusivity and Participation Patterns

Classroom observations revealed a notable shift in participation dynamics. Students who were hesitant to ask questions during face-to-face sessions became more active contributors in WhatsApp-based discussions. The asynchronous environment reduced linguistic and psychological barriers, allowing students to engage at their own pace. This suggests that a blended approach may be more inclusive than a purely traditional model within the Arunachal context.

5.3 Cost Efficiency and Resource Resilience

The framework required no additional financial investment from either the institution or students. By prioritizing handwritten content and image-based sharing over video or live-streamed instruction, data usage was minimized. This low-cost and resilient design directly addresses infrastructural limitations highlighted in existing literature on rural higher education.

VI. Alignment with National Education Policy 2020

The blended learning framework demonstrates practical alignment with several principles of the National Education Policy 2020. Experiential learning is reflected in student-created concept maps and peer interaction. Pragmatic ICT integration is achieved through the academic use of widely accessible mobile applications, fostering functional digital literacy without imposing unrealistic technological demands. The framework also promotes learner autonomy and resilience, reinforcing NEP 2020's emphasis on self-directed and flexible learning pathways.

VII. Conclusion

In low-resource higher education contexts such as Arunachal Pradesh, blended learning must be understood not as a technology-intensive innovation but as a functional necessity for syllabus continuity. This practitioner-driven study demonstrates that a context-sensitive integration of blackboard-based instruction and low-bandwidth digital communication can effectively sustain student engagement and inclusivity despite infrastructural challenges.

The proposed framework offers a realistic, scalable, and cost-effective model for educators working in similarly constrained environments and contributes grounded insights to the broader discourse on blended learning in rural higher education.

REFERENCES

[1] Alebaikan R, Troudi S. Blended learning in Saudi universities: Challenges and perspectives. ALT-J. 2010;18(1):49–59.

[2] Jamoh T. Bridging the digital divide in Arunachal colleges. International Journal of Future Multidisciplinary Research. 2025.

[3] Nirola B, Barik PK, Naik C. Exploring pre-service secondary teachers' perceptions on blended learning. Journal of Educational Technology Studies. 2024.

[4] Ministry of Education. (2020). National Education Policy 2020. Government of India.

[5] Tilak, J. B. (2020). National Education Policy 2020 and blended learning: Challenges and opportunities in India. Economic and Political Weekly, 55(22), 67–74.