



**Infrastructure and Digital Divide: Addressing the Barriers to Technology
Implementation under NEP 2020 in the Secondary Schools of Assam's Char-chapori
Region**

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ABSTRACT

The New Education Policy (NEP) 2020 envisions the integration of technology as a transformative tool to enhance access, equity, and quality education across India. However, geographically marginalized regions such as the char-chapori areas of Assam face unique challenges to technological integration due to recurrent flooding, poor infrastructure, and socio-economic constraints. This study reflects on the transformative power of educational technology (EdTech) as well as investigates the readiness of char-chapori schools to implement NEP's EdTech provisions by assessing the status of Information and Communication Technology (ICT) infrastructure, teacher and student preparedness, and feasibility of digital pedagogies. The research used a mixed-methods approach, incorporating an infrastructure assessment, surveys of educators and students, and key informant interviews with school officials. Findings of the study reveal a significant deficit in electricity supply, internet connectivity, and device availability, compounded by seasonal displacement and low digital literacy levels. The study emphasises the need for affordable, contextually appropriate solutions by highlighting the gap between policy goals and actual conditions on the ground. Mobile-based microlearning, offline digital content, solar-powered ICT labs, and focused teacher ICT training are

among the suggestions. These insights can inform policy refinements to ensure NEP's digital vision is inclusive for students attending schools in the riverine areas of Assam.

Introduction

The New Education Policy (NEP) 2020 established an extensive framework for reforming the Indian education system to address the requirements of the 21st century. One of the central component of this vision is the integration of Information and Communication Technology (ICT) to enhance teaching–learning processes, improve access, and equity in education. Digital platforms such as DIKSHA, Swayam, and e-pathshala are intended to provide quality resources to learners and teachers, while the policy also emphasizes on ICT-based teacher professional development.

The success of these programs depends on sufficient infrastructure, teacher readiness, and socio-economic preparedness. The char-chapori areas of Assam - riverine islands and alluvial banks of the river Brahmaputra - represent a distinct challenge. These areas are characterized by geographical isolation, recurrent floods, displacement, and socio-economic marginalization (Saikia, 2019). Given the existing constraints posed by infrastructural shortcomings and human resource deficits, the implementation of technology-based reforms in education encounters further challenges in the region.

Globally, educational technology has been recognised as a powerful balancer capable of closing geographical and socioeconomic barriers in learning possibilities. When properly implemented, EdTech can provide quality educational resources to remote learners, facilitate differentiated instruction, and promote lifelong learning. In rural areas, the use of ICT in education can assist overcome teacher shortages, provide instruction in many languages with locally relevant content, and connect students to educational resources and communities on a national and global scale (Trucano, 2005). However, providing devices or internet connections alone won't be enough to realise educational technology's revolutionary potential. It necessitates dependable infrastructure, material that is culturally and linguistically appropriate, ongoing teacher capacity building, and governance and policy frameworks that are supportive.

Thus, the present study focuses on identifying the key infrastructural and digital imbalance that hinder NEP's technology integration in the schools of char-chapori regions. By examining both physical readiness (electricity, internet, devices) and teacher-learner related factors (teacher competence, student



access), the study aims to bridge the knowledge gap on how NEP's EdTech vision transform into practice in such marginalized contexts.

Review of Literature

During the study on “Infrastructure and Digital Divide: Addressing the Barriers to Technology Implementation under NEP 2020 in the Secondary Schools of Assam's Char-chapori Region”, I have gone through review of literature. The study shows that NEP 2020 emphasizes the importance of digital tools in reducing disparities, promoting blended learning, and fostering lifelong learning. It calls for the establishment of a National Educational Technology Forum (NETF) to guide EdTech adoption and teacher training. Several studies have highlighted that successful implementation of such policies depends on the possible alignment of technological resources with local realities. The digital gap in India is multifaceted, involving access to gadgets, internet connectivity, digital literacy, affordability, and the capacity to effectively utilise technology. Rural areas face significant deficits in all these domains, often exacerbated by gender and economic disparities. In Assam specifically, emerging research indicates that digital literacy levels vary sharply across gender, age, and social divisions, further highlighting the region's uneven technological readiness.

Access to education in Assam's char-chapori regions has traditionally been limited by ecological fragility and socio-economic disenfranchisement. Seasonal movement caused by floods and erosion interrupts educational cycles, while inadequate infrastructure and instructor absence intensify the difficulties. ICT integration into the schools of such regions remains largely unrealized despite its potential to bridge educational disparities. Furthermore, secondary schools in Char regions show a strong desire for ICT inclusion, but administrative and infrastructure issues limit its implementation (Amin, 2023). Furthermore, head teachers in more accessible areas of Assam acknowledge the importance of ICT in improving student engagement and teaching quality, but they point to a lack of infrastructure and qualified staff as obstacles (Bordoloi, Choudhury, & Roy, 2024). Therefore, in order to promote fair and long-lasting educational transformation, ICT integration for the schools of char-chapori region must be combined with resilience-building infrastructure, teacher training, and policy support.

Research Objectives

1. To assess the current state of ICT infrastructure and teacher-student readiness for digital learning under NEP 2020;
2. To identify the socio-economic and environmental factors affecting technology integration;



3. To recommend feasible and context-specific strategies for EdTech adoption in the schools of char-chapori areas.

Methodology

A mixed-methods approach was adopted in this study, integrating qualitative insights with quantitative evaluations. Primary data were collected from 8 government secondary schools in flood-prone char-chapori areas of Barpeta and Dhubri districts given the fact that a significant number of schools exist in the char regions of these districts. A purposive sampling method was used to select the schools for their recurrent infrastructural challenges.

The sample included 16 teachers, 30 students studying in classes IX–XII, and 3 educational administrators. Three methods were used to collect the data: semi-structured interviews with head teachers and administrators to gather their perspectives on policy and implementation; structured surveys with teachers and students about ICT usage and challenges; and an infrastructure audit of electricity, internet connectivity, and devices.

While qualitative responses were thematically categorised to find recurrent themes, quantitative data were analysed using descriptive statistics. Field findings were additionally contextualised and validated using secondary data from government papers, policy documents, and previous studies.

Findings and Discussion

The findings demonstrate the intricate interactions between socioeconomic, human, and infrastructure elements influencing the likelihood of ICT integration in char-chapori schools. This section examines these findings in light of NEP 2020's goals, highlighting both enduring difficulties and possible future directions.

i) **ICT Infrastructure Status:** The ICT Infrastructure Status may be stated as below:

a) **Electricity supply and internet connectivity:** While most schools are connected to the power grid, the supply remains highly erratic, and several schools lack backup arrangements, particularly during frequent outages in the monsoon season. Only one school had access to broadband, while the others relied on unreliable mobile data connections or had no internet facility at all.

b) **Device Availability:** Digital device access in schools was woefully insufficient. Students had very limited opportunities to engage with technology in the classroom. None of the schools were well



equipped with tablets or similar handheld devices, leaving students largely excluded from the kind of digital learning experiences envisioned under NEP 2020

c) Classroom Facilities: Many schools lacked dedicated ICT laboratories, and in cases where such spaces existed, they were not fully functional. The efficient use of these facilities for teaching and learning was further limited by a lack of funding, poor upkeep, and inadequate technical assistance.

d) Teacher readiness: In general, educators' trust in incorporating digital resources into their teaching practices was low. Many reported having trouble adjusting to the accessible digital content and had never had any ICT training. Lack of technical help, inexperience with technology, and difficulties accessing materials in local languages were among the issues raised.

e) Students' skill and access: Students have a difficult time using and gaining access to digital technology. Access to the internet outside of school was restricted, and personal device ownership was rare. The majority of students used technology mostly for leisure rather than education, and their levels of digital literacy were generally low.

ii) Environmental and socio-economic barriers: Recurrent environmental issues frequently interrupted educational activities in the char-chapori districts, making it challenging to maintain regular school operations. At the family level, financial strains forced many families to put their immediate needs before of spending money on electronics or internet connection. Digital integration was often seen as less vital than preserving access to basic education itself, despite the fact that community attitudes towards technology in education were generally positive.

- **Discussion:** The results show a significant discrepancy between the actual situation in char-chapori districts and the technology integration objectives of NEP 2020. char-chapori schools deal with frequent disruptions and infrastructural deficiencies, whereas NEP assumes baseline infrastructure and steady learning settings.

The digital gap in this case is both structural (lack of energy, internet, and gadgets) and functional (poor digital skills among teachers and pupils). This is corresponding to Selwyn's concept of the "second-level digital divide," in which access alone does not ensure meaningful use.

The environmental challenges specific to the char-chapori regions exacerbate the situation. Flood damage to ICT equipment, evacuation of people, and seasonal school closures all impede the continuity of digital learning. Thus, performing NEP's EdTech agenda in such places necessitates adaptive resilience-based approaches rather than the direct transplantation of urban-centric solutions.

- **Recommendations:** The Recommendations to this regard may humbly be as follows-



i) Infrastructure Solutions: Promote solar-powered ICT labs to reduce reliance on unstable electricity, provide waterproof equipment storage, and implement offline digital libraries to ensure access during internet disruptions.

ii) Teacher Capacity Building: Provide a regional ICT training in Assamese and regional languages, promote peer-to-peer mentorship for digital pedagogy, and incentivise teachers who use ICT effectively during disruptive moments.

iii) Student Access Initiatives: Create community-based device-sharing models, roll out mobile-friendly microlearning modules for low-end cellphones, and incorporate digital literacy into the core curriculum.

iv) Policy and Governance: Incorporate flood-resilient EdTech into district education planning, strengthen cooperation with NGOs and CSR projects to provide resources, and set up monitoring tools to track NEP implementation in susceptible areas.

• Conclusion

NEP 2020's emphasis on technology provides a road to inclusive and high-quality education, but unless it addresses the infrastructural and contextual realities of marginalised regions like Char-Chapori, its advantages may circumvent the communities it intends to support. The findings of this study emphasise the critical need for adaptable, low-cost, and resilient EdTech models that can resist environmental changes while increasing local capacity. Policymakers must recognise the variety of implementation situations and modify measures accordingly in order to overcome India's ongoing digital divide.

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