

# Overcoming Implementation Challenges Of Digital Resources In Rural India: An Analysis And Recommendations

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## Abstract

India recently surpassed China to become the most populous country in the world. India's effective use of the burgeoning population will determine its economic growth and success in the global landscape. Currently, 26% of India's population is below 14 years, and approximately 67% is between the age of 15 to 64 years.<sup>1</sup> Given the large percentage of the population being in the students' category, it is imperative to revolutionize India's education landscape to help create more skilled workers in the economy. Digital learning is an important tool for providing quality education to children in rural India. However, although several schemes have been introduced to promote e-learning, there are still many challenges to be overcome.

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## I. Introduction

The first step to improving Indian educational infrastructure was the new National Education Policy (NEP) 2020, which promotes a multidisciplinary approach to education. The five fundamental pillars of NEP 2020 are Access, Equity, Quality, Affordability, and Accountability which corresponds with Sustainable Development Goals (SDGs) 2030 Agenda. The main features of NEP 2020 include raising the Gross Enrollment Rate (GER) for higher education to 50 percent by 2035 and 100 percent in preschool to secondary level by 2030. Moreover, the 10+2 school curricula structure will be replaced with 5+3+3+4, bringing the age group of 3-6 years under the umbrella of the school curriculum.<sup>2</sup> One of the key goals of NEP 2020 is to integrate technology into education to leverage digital educational resources. However, this principle is yet to see fruition in rural India.

Approximately 64.61% of the Indian population resides in rural India.<sup>3</sup> However, most of them do not have access to quality education resources due to several challenges. First, lack of proper infrastructure, such as smart classrooms and basic amenities such as washrooms. Second, inadequate teaching resources such as textbooks and technology. Third, shortage of qualified teachers due to rural locations and low salaries. Lastly, cultural and social barriers include girls dropping off at a young age to contribute to household chores.<sup>4</sup> Most of these challenges can be addressed through the promotion of digital learning. This paper first presents a review of schemes implemented by the Indian Government to promote digital education. It then analyzes the challenges to the implementation of these schemes and lastly concludes with suggesting ways on how to address these challenges.

## II. Review of Initiatives by Indian Government Institutions to promote E-learning<sup>567</sup>

The Indian government is implementing various e-learning initiatives to improve rural education by leveraging digital technologies. Some of the initiatives include:

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<sup>1</sup>[India@100: reaping the demographic dividend](#)

<sup>2</sup> National Educational Policy 2020, Major Transformational Reforms in Education Sector

<sup>3</sup>[India - Rural Population - 2023 Data 2024 Forecast 1960-2021 Historical](#)

<sup>4</sup>[Education In Rural India : Challenges, Opportunities, Initiatives | Art of How To](#)

<sup>5</sup>[e-Education: Digital Initiatives in India](#)

<sup>6</sup><https://pib.gov.in/indexd.aspx>

<sup>7</sup><https://mhrd.gov.in/>

- eVidyaloka which aims to enable quality education in rural India through online interaction and study with volunteer teachers.
- E-Kranti aims to bridge the digital divide between remote and urban areas by providing basic infrastructure for internet services, which is crucial for digitizing rural education.
- NISHTHA, the National Initiative for School Heads' and Teachers' Holistic Advancements, focuses on training over 42 lakh teachers in most recent educational skills such as how to use digital learning resources to boost education and employment.
- E-pathshala, developed by NCERT, showcases and disseminates educational e-resources, including textbooks, audio, video, periodicals, and other materials.
- National Repository of Open Educational Resources (NROER) is an initiative to bring together digital resources across schools including documents, audio, videos, images, and collections.
- SWAYAM is an integrated platform offering online courses from the school to the postgraduate level. Over 2769 MOOCs have been offered, with approximately 1.02 crore students enrolling in various courses.
- SWAYAM Prabha provides 32 high-quality educational channels through DTH to make learning resources accessible in remote areas with limited internet availability.
- Eklavya is an online assessment and knowledge management solution used for conducting entrance exams, with features such as remote proctoring and offline mode exams.
- Virtual Labs aim to provide remote access to labs in various disciplines, promoting remote experimentation and providing a complete learning management system. The project shares costly equipment and resources, enabling a larger number of users to benefit.
- Spoken Tutorial is an initiative to popularize software development and usage through spoken tutorials coordinated via a dedicated website.
- E-SHODH SINDHU is an initiative merging three consortia initiatives to provide member institutions with access to core journals, bibliographic databases, and factual databases.
- Operation Digital Board (ODB) is a scheme to establish smart classrooms in classes IX to XII of government and government-aided schools.
- Quick Response (QR) codes integrated with NCERT textbooks allow easy access to digital resources for students, teachers, parents, and educators.
- E-Yantra aims to enhance education in embedded systems and robotics across engineering colleges in India through training workshops and open-source content.

### **III. Challenges to the Implementation of these schemes in rural India**

Many of the existing schemes, designed to have a positive impact on the rural population, often fail to effectively reach their intended beneficiaries. Schools and colleges in rural India still lack digital learning resources. The following are the main challenges faced in the successful implementation of e-learning in rural India:

- Lack of proper devices for e-learning: Although the penetration of internet is 86% as of 2023 in rural India<sup>8</sup>, internet is mainly utilized through phones. However, phone screens aren't conducive to long learning hours. Students instead need laptops or computers but the high cost of such devices imposes a high barrier. Many of the schemes rely on students having access to digital devices and hence cannot be implemented successfully.
- Lack of digital infrastructure in rural schools and colleges: The cost of setting up IT resources in rural schools and subscribing to monthly internet data packs are a big cost deterrent for most rural schools to set up e-learning stations. The success of schemes such as E-pathshala depend mainly on schools having access to digital equipment.
- Lack of digital resources in vernacular languages: Multilingualism also creates a barrier in wide adoption of e-learning resources. Most of the digital learning resources are available in English and there is limited availability of quality content in Hindi and other local languages leading to a language barrier.
- Social and cultural barriers disproportionately impact girls: The gender divide in rural India exacerbates the digital divide leading to girls being the most adversely impacted in leveraging the benefits of digital education. In addition, lack of computer based courses and skills in rural primary schools hamper the progress of learning how to effectively use digital learning resources.
- Lack of proper information on the schemes: several rural schools do not have access to the schemes offered by the Indian Government and are hence not able to leverage the opportunities it presents to advance e-learning.

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<sup>8</sup>[Rural India had 44% more internet users compared to urban markets: Nielsen report - The Economic Times.](#)

#### **IV. Conclusion**

There are several steps that can be taken to address these challenges. First, the government can subsidize or provide tax benefits to ed-tech companies to work on low-cost multi-lingual learning platforms that can be operated on low-bandwidth. Second, the state government can provide monthly free training programs for teachers to learn how to use digital resources and content to maximize learning. Third, state governments and district government authorities can partner with local private institutions to equip rural schools with required infrastructure. Fourth, the local businesses should be encouraged to promote digital education through their CSR activities. Lastly, for schools without access to proper electricity due to location, alternative sources of energy such as solar panels can be installed.<sup>9</sup>

Promoting digital education in rural areas of India is crucial for the country's advancement towards achieving SDG 4, Quality Education. By embracing digital learning initiatives, India can effectively equip its future labor force with the necessary skills to thrive in an increasingly digital world. This transformative approach holds immense potential to bridge the educational divide, empower rural communities, and drive inclusive economic growth. As India embraces the power of technology, it paves the way for a brighter future where every individual, regardless of their geographic location, has equal access to quality education.

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<sup>9</sup>[Digital Education Barriers In Rural India](#)