



## From Access to Opportunity: Rethinking the Digital Divide in Indian School Education

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**Abstract:** *Our world is experiencing sweeping changes due to advances in information and communication technologies. Thus, educational success flourishes where equality and fairness are upheld. However, the swift digitization of school education in India, particularly in the post-COVID-19 period, has exposed significant disparities in access to technological resources. First gaining attention in the 1990s, the idea of the digital divide has gradually evolved. It is now defined by gaps in knowledge, technological access, and infrastructure, posing major challenges for the general population in developing countries. India is characterized by extensive rich social diversity, yet certain communities have faced long-standing exclusion that persists in contemporary society. This study examines the effects of the digital divide in school education, as the digital divide poses serious challenges to future development by restricting social mobility, creating structural barriers, and deepening exclusion for marginalized groups.*

**Keywords:** *Digitization, Technological Resources, Digital Divide, Social Diversity.*

**Introduction:** The COVID-19 pandemic created numerous challenges in India, resulting in the abrupt temporary closure of educational institutions at all levels. This unprecedented situation accelerated innovation in education and encouraged the adoption of alternative approaches to ensure the continuity of learning across the country. In response, technology has played a crucial role in sustaining the education system. Innovative teaching-learning approaches were rapidly adopted, requiring both educators and learners to adjust to digital platforms to ensure the continuity of instruction. However, the compulsory shift to technology-mediated learning exposed several difficulties in the student community. Many students, especially those from rural backgrounds and marginalized communities, faced problems related to poor internet connectivity, limited data availability, and inadequate access to digital devices such as smartphones and laptops. These challenges highlight the phenomenon commonly referred to as the digital divide, (an idea that emerged during the mid-1990s), which denotes the disparity between individuals or groups who have access to modern information and communication technologies (ICT) and those who lack such access. This gap significantly influences students' ability to utilize digital tools in school education, thereby affecting their capacity to participate effectively in learning processes, and achieve academic success.

This study examines the impact of educational digitalization in India, with particular attention to its implications for students from rural and urban backgrounds. It critically explores the assumption that the digital divide has intensified disparities between the privileged and the marginalized. Additionally, it proposes recommendations to promote more inclusive blended learning practices and the effective use of ICT, with the aim of narrowing the digital divide.

**Framing the Digital Divide: A Theoretical Overview:** India illustrates a stark duality in its digital education landscape, where elite private institutions operate fully technology-enabled classrooms, while many rural government schools continue to face severe shortages of even basic digital infrastructure. Although the National Education Policy (NEP) 2020 articulates a vision of universal digital access, scholars have criticized it for its predominantly urban orientation and limited sensitivity to diverse local contexts. Flagship programmes such as PM eVidya and DIKSHA have undoubtedly broadened the availability of digital learning resources; however, empirical assessments indicate that their reach remains significantly constrained among marginalized populations. In these contexts, access to digital education continues to be shaped by socio-economic factors such as household income, parental educational attainment, and prevailing gender norms.

The Digital Divide, a complex phenomenon, can be classified into three levels: Access Divide, Usage Divide, Quality divide. The first level represents material access to digital infrastructure, including reliable internet connectivity, consistent electricity supply, and ownership of appropriate devices. Such access is largely influenced by factors such as socio-economic background and geographical location, thereby affecting individuals' scope for active participation in the digital sphere. The second level represents disparities in individuals' capacity to effectively navigate and utilize digital tools and online platforms. In many rural and geographically remote regions, the absence of reliable high-speed internet, frequent power disruptions and inadequate supporting infrastructure significantly restricts the effective use of online educational materials. Furthermore, a considerable proportion of students enrolled in government schools come from economically disadvantaged backgrounds and marginalized communities and are unable to afford high-speed internet services, thereby limiting their participation in digital learning environments. Language barriers also pose a serious challenge, as much of the available digital content is delivered in English or dominant regional languages, making it difficult for many learners to comprehend. Additionally, limited parental education and digital literacy reduce the extent to which families can guide or support children in navigating online learning environments, thereby deepening existing educational inequalities. And the third level represents the inequalities in digital education which are further reflected in the type and quality of devices available to students, the level of teacher preparedness, and the learning outcomes achieved. Students in well-resourced private schools often benefit from advanced sophisticated technological infrastructure, including interactive smart boards, computer laboratories, learning management systems, and high-speed internet connectivity. In contrast, many students—particularly those in government schools or economically disadvantaged households—depend solely on basic smartphones with limited functionality, shared usage and limited internet data plan. Such disparities in device quality directly affect the depth of engagement with the digital content. Moreover, variations in teachers' digital competence and pedagogical readiness significantly influence the effectiveness of technology integration into classroom practices. Also, in many instances, digital resources are either generic or insufficiently aligned with curricular objectives, limiting their educational value. These disparities are reflected in uneven student engagement, comprehension, and academic performance. Thus, even when students have basic access to devices and connectivity, the educational advantages derived from technology remain highly unequal.

**Exploring the Gender Gap in Digital Education:** Gender disparities significantly intensify the digital divide in Indian school education. Research indicates that girls often experience limited access to mobile phones and internet services compared to boys, largely due to entrenched cultural norms, domestic responsibilities, and concerns regarding online safety. Empirical evidence from rural regions of India suggests that female students are substantially less likely—by nearly 34.6 percent—to have access to smartphones or computers for educational use compared to their male peers. Societal perceptions surrounding female mobility, social acceptability, and fears of online harassment often result in stricter monitoring or denial of digital access for girls. These intersecting social and cultural constraints limit girls' participation in online learning environments and hinder their opportunities for digital skill acquisition, thereby reinforcing broader patterns of educational and gendered inequality.

**Teacher Preparedness and Digital Competence:** The digital transformation in education has significantly reshaped the professional responsibilities of teachers. As classrooms increasingly integrate technological tools, educators are required to incorporate digital resources into their pedagogical practices. Effective implementation of digital education demands that teachers develop competence in the use of Information and Communication Technologies (ICT) for instructional purposes. However, inadequate infrastructure, limited institutional support, and insufficient access to professional development opportunities often constrain their ability to deliver engaging and technologically enriched learning experiences.

Despite these challenges, many teachers are gradually adapting to digitally mediated modes of instruction by adopting innovative teaching strategies. Technology has enabled educators to access diverse knowledge sources, multimedia content, and interactive platforms, thereby expanding the scope of classroom instruction beyond traditional methods of teaching.

Research indicates that the successful integration of technology in education largely depends on teachers' perceptions and attitudes toward its use. Hortoványi and Ferincz (2015) argue that teachers' beliefs about the relevance and usefulness of digital tools significantly influence their classroom adoption. Positive attitudes toward ICT tend to encourage experimentation and innovation, whereas resistance to change may hinder effective technology integration. While some educators actively seek to upgrade their digital skills and adapt to emerging technologies, others remain hesitant due to lack of confidence, training, or institutional encouragement.

Recognizing the importance of teacher preparedness, the Government of India has initiated collaborations with major technology companies to strengthen the digital capacity of education. Sharma (2021) highlights the significance of systematic teacher training programmes focused on classroom technology integration. She underscores the government's commitment to enhancing teachers' digital literacy through partnerships with leading technology firms, with the broader objective of narrowing the digital divide and promoting equitable educational opportunities nationwide.

**State-Led Efforts to Foster Digital Access and Inclusion:** The Government of India has launched several programmes, schemes, and digital platforms to address the digital divide and promote inclusive access to education. Major infrastructure initiatives such as the National Optical Fibre Network (NOFN), later expanded as the BharatNet Programme, aim to provide broadband connectivity to over 2.5 lakh Gram Panchayats, making it one of the world's largest rural broadband projects. Complementing infrastructure development, digital literacy initiatives such as the National Digital Literacy Mission and the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) were introduced to enhance digital awareness and skills among rural populations by covering millions of households. However, assessments by the Standing Committee on Information Technology (2019) highlighted significant gaps in the effectiveness and reach of these literacy efforts.

In the education sector, the Ministry of Education, in collaboration with the University Grants Commission (UGC), has developed multiple digital learning platforms and repositories. These include DIKSHA, which provides e-textbooks, QR-coded learning resources, and professional development modules for teachers, and e-Pathshala, which offers digital curricular content for students. Platforms such as SWAYAM and SWAYAM Prabha extend access through online courses and Direct-to-Home (DTH) television channels, while radio-based initiatives like Gyandhara and Gyandarshan have been particularly effective in reaching learners in remote areas lacking internet connectivity.

During the COVID-19 pandemic, the PM eVidya initiative adopted a multimodal strategy by integrating online platforms, television, radio, and podcast-based learning to mitigate the disruptions caused by limited digital access. Additionally, the Samagra Shiksha scheme has supported the establishment of ICT infrastructure, smart classrooms, and teacher training programmes, especially in government schools. The National Education Policy (NEP) 2020 further recognises the digital divide as a critical challenge and

underscores the need for robust digital infrastructure, virtual laboratories, teacher capacity building, and technology-enabled inclusive education. Despite the breadth of these initiatives, persistent implementation challenges and regional disparities indicate that significant gaps remain in translating policy intentions into equitable digital access and learning outcomes.

**Conclusion:** The digitalization of school education has expanded learning opportunities by enabling students to access online classes, multimedia resources, and instructional materials beyond the physical classroom environment. During the COVID-19 pandemic, digital platforms played a crucial role in ensuring the continuity of schooling. However, the rapid shift toward digital modes of instruction has also exposed significant inequalities in access, particularly among school students from economically and socially disadvantaged backgrounds.

Addressing these disparities requires coordinated efforts from governments, schools, and technology providers to ensure that digital transformation does not exacerbate existing educational inequalities. Socio-economic status continues to shape access to devices, reliable internet connectivity, electricity, and supportive home environments. From a critical perspective, market-driven models of digital expansion often privilege affluent communities, leaving under-resourced government schools and marginalised populations at a disadvantage. In addition to access-related challenges, the increasing reliance on online platforms has raised serious concerns regarding data privacy and cybersecurity. Students' personal information, learning data, and online activities may be vulnerable to misuse, surveillance, or cyber threats, particularly in contexts where regulatory safeguards and digital awareness remain limited.

To ensure that digitalization promotes inclusion rather than exclusion, policy measures must prioritize equitable access as well as digital safety. Governments can provide subsidized or free devices and affordable internet services for economically weaker students, strengthen public digital infrastructure in schools, and establish clear data protection frameworks to safeguard students' information. At the institutional level, improving the student-to-computer ratio, establishing shared digital learning spaces, and allowing supervised access to school internet facilities beyond regular hours can help reduce disparities. Such measures are essential to ensure that digital education in schools promotes empowerment and social justice rather than reinforcing socio-economic inequalities.

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