



BRIDGING THE DIGITAL DIVIDE IN EDUCATION: POLICY DISCOURSE, STRUCTURAL INEQUALITY, AND EQUITY CHALLENGES IN CONTEMPORARY INDIA

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Abstract

The rapid expansion of digital technologies has transformed educational systems in India, yet significant disparities persist in access, usage, and learning outcomes. This study critically examines the digital divide in education through the lens of policy discourse, structural inequality, and equity challenges in contemporary India. Moving beyond infrastructure-centric explanations, the research conceptualizes digital exclusion as a multidimensional phenomenon shaped by caste, class, gender, geography, language, and institutional capacity. Using a qualitative and literature-driven approach, the study synthesizes scholarly research, policy documents, and empirical evidence to identify patterns of marginalization and inclusion across rural and urban contexts. The findings reveal a persistent gap between policy aspirations of digital democratization and the lived realities of marginalized communities. Infrastructural deficits, limited digital literacy, inadequate teacher preparedness, and socio-cultural constraints collectively reinforce stratified educational outcomes. The study argues that bridging the digital divide requires an integrated social justice framework that combines technological investment with targeted equity measures, participatory governance, and institutional accountability. By situating digital transformation within broader socio-economic and political structures, this research contributes to contemporary debates on inclusive education and highlights pathways for achieving equitable and sustainable digital reform in India.

Keywords: *Digital divide, Educational inequality, Digital policy, Structural inequality, Equity in education, Rural–urban disparity, Digital literacy, Contemporary India.*

Introduction

The rapid expansion of digital technologies has transformed educational systems across the globe, reshaping pedagogical practices, institutional governance, and student engagement. Yet, the promise of digital education remains unevenly distributed, particularly in countries characterized by deep socio-economic stratification. In contemporary India, the digital divide in education has emerged as a critical policy concern, revealing entrenched structural inequalities that limit equitable access to digital learning opportunities. While government initiatives and private sector interventions have sought to expand connectivity and digital infrastructure, disparities in access, digital literacy, and socio-cultural capital persist (Tewathia et al., 2020; Kumari&Tiwari, 2025). The discourse surrounding digital transformation in education increasingly emphasizes inclusion and equity; however, the lived realities of marginalized communities indicate a significant gap between policy aspirations and implementation outcomes (Ahmed, 2025; Pillai et al., 2025).

The digital divide extends beyond mere access to devices and internet connectivity. Scholars conceptualize it as a multi-dimensional phenomenon encompassing infrastructural gaps, skill deficits, usage disparities, and differences in learning outcomes (Hamilton & Pitt, 2011; Papadopoulos & Cleveland, 2023). In the Indian context, rural–urban disparities, gender inequalities, caste-based exclusion, and regional economic imbalances intersect to produce layered forms of digital



marginalization (Kulal et al., 2024; Singh, 2025). For instance, while metropolitan regions benefit from high-speed broadband and institutional digital readiness, many rural and tribal areas struggle with unstable connectivity and limited digital ecosystems (Tewathia et al., 2020; Murali&Govindan, 2025). These structural inequalities are compounded by disparities in household income, parental education, and language proficiency, which influence students' ability to effectively engage with digital platforms (Kumari&Tiwari, 2025; Haque et al., 2025).

Policy discourse in India has increasingly framed digital education as a pathway to democratization and national development. Programs aligned with broader digital governance initiatives emphasize online learning platforms, virtual classrooms, and AI-enabled educational tools (Agarwal et al., 2026; Mertala et al., 2024). However, critical analyses suggest that technology-centric reforms often overlook contextual constraints and socio-political dimensions of inequality (Moghayedi, 2025; Shalaby, 2025). The assumption that technological diffusion automatically translates into educational equity has been challenged by empirical studies demonstrating persistent achievement gaps despite expanded digital infrastructure (Tang & Aldrich, 2026; Wan et al., 2026). Thus, bridging the digital divide requires not only infrastructural investment but also systemic reforms addressing pedagogical capacity, teacher training, and community engagement (Bawa&Bawa, 2025; Schiavi et al., 2025).

The COVID-19 pandemic intensified the urgency of digital inclusion in education. Nationwide school closures exposed the fragility of digital preparedness, particularly among economically disadvantaged students (Tewathia et al., 2020; Shrivastav et al., 2025). While urban private institutions transitioned relatively smoothly to online platforms, students in government schools often faced device shortages, shared smartphones, and limited internet bandwidth (Sen et al., 2025; Mhaske et al., 2025). These disruptions highlighted how digital inequities mirror and magnify pre-existing structural disadvantages. Gendered patterns of access also became more pronounced, with girls in certain regions experiencing reduced digital access due to socio-cultural norms and household responsibilities (Kumari&Tiwari, 2025; Balarabe, 2025). Consequently, the digital divide is not a temporary technological gap but a reflection of broader socio-economic hierarchies embedded within educational systems.

Emerging scholarship underscores the importance of digital literacy and critical engagement rather than mere connectivity. Digital competence encompasses cognitive, technical, and socio-emotional dimensions that shape meaningful participation in online learning environments (Hamilton & Pitt, 2011; Mertala et al., 2024). Inadequate teacher preparedness and limited institutional support further constrain the effective integration of technology in classrooms (Bawa&Bawa, 2025; Tariq et al., 2026). Without sustained professional development and inclusive curricular design, digital tools risk reinforcing passive consumption rather than transformative learning. Additionally, language barriers and culturally mismatched content can marginalize students from non-dominant linguistic backgrounds, reinforcing epistemic inequalities (Haque et al., 2025; Singh, 2025).

At the policy level, debates increasingly focus on balancing technological innovation with social justice frameworks. Equity-oriented digital strategies advocate targeted subsidies, community-based digital centers, and context-sensitive platform design (Agarwal et al., 2026; AhmadiDehrashid et al., 2026). International comparative studies reveal that successful digital inclusion models integrate infrastructure expansion with socio-cultural empowerment and participatory governance (Papadopoulos & Cleveland, 2023; Tang & Aldrich, 2026). For India, a country marked by demographic diversity and regional heterogeneity, such an integrated approach is particularly crucial. Structural inequality—manifested



through caste, class, gender, and geography—must be recognized as central to any meaningful policy intervention (Kulal et al., 2024; Ahmed, 2025).

This study situates the digital divide within the broader discourse of structural inequality and policy reform in contemporary India. By critically examining the interplay between technological expansion and socio-economic stratification, it seeks to illuminate the limitations of infrastructure-centric approaches and foreground equity-driven alternatives. Bridging the digital divide demands more than technological diffusion; it requires a reimagining of educational policy through the lens of distributive justice, participatory inclusion, and institutional accountability (Moghayedi, 2025; Wan et al., 2026). Only by addressing the structural roots of inequality can digital transformation contribute to genuinely inclusive and sustainable educational development in India (Sen et al., 2025; Pillai et al., 2025).

Literature Review

The discourse on the digital divide in education has evolved significantly over the past two decades, moving from a narrow focus on technological access to a broader examination of structural inequality, policy frameworks, and socio-cultural determinants. Early conceptualizations of the digital divide emphasized disparities in access to hardware and internet connectivity. However, contemporary scholarship recognizes that digital exclusion is multidimensional, encompassing access, skills, usage patterns, and differential educational outcomes (Hamilton & Pitt, 2011; Papadopoulos & Cleveland, 2023). Within the Indian context, these dimensions intersect with entrenched socio-economic hierarchies, including caste, gender, geography, and class, thereby complicating policy efforts aimed at universal digital inclusion (Kulal et al., 2024; Singh, 2025).

Hamilton and Pitt (2011) argue that the digital divide must be understood through the lens of social practice rather than technological determinism. Their framework highlights how digital engagement is mediated by institutional norms, literacy levels, and socio-economic capital. Expanding on this perspective, Papadopoulos and Cleveland (2023) propose a layered model distinguishing between first-level (access), second-level (skills and usage), and third-level (outcomes) divides. This stratified understanding is particularly relevant in emerging economies where technological penetration has increased, yet disparities in effective utilization remain pronounced. In India, while mobile internet penetration has grown substantially, disparities in digital literacy and meaningful engagement persist, particularly among rural and marginalized communities (Tewathia et al., 2020; Kumari&Tiwari, 2025).

Recent studies emphasize that digital exclusion is not merely technological but deeply embedded within structural inequalities. Ahmed (2025) contends that digital transformation policies often reproduce existing hierarchies by privileging urban, English-speaking, and economically advantaged populations. Similarly, Kulal et al. (2024) identify how caste and regional disparities influence access to digital educational resources, suggesting that technological reforms must be contextualized within broader socio-political realities. These findings align with global analyses highlighting how digital inequities reflect systemic social stratification (Tang & Aldrich, 2026; Wan et al., 2026).

India's policy landscape has increasingly prioritized digitalization as a cornerstone of educational reform. Initiatives promoting online platforms, virtual classrooms, and AI-driven learning tools are framed as mechanisms for democratizing education and expanding reach (Agarwal et al., 2026; Mertala et al., 2024). However, Moghayedi (2025) critiques technology-centric governance models, arguing that they often overlook grassroots infrastructural deficits and local pedagogical contexts. The emphasis



on scalable digital solutions may obscure the uneven capacities of schools and communities to adopt and sustain such interventions.

AhmadiDehrashid et al. (2026) highlight the importance of participatory governance in digital policy implementation, noting that top-down approaches frequently fail to account for localized challenges. In India, Murali and Govindan (2025) demonstrate that rural institutions often lack stable electricity, reliable broadband, and technical support systems, limiting the effectiveness of digital education programs. Such infrastructural constraints illustrate the disconnect between national policy discourse and on-the-ground realities. Moreover, Schiavi et al. (2025) argue that digital governance must incorporate equity audits and accountability mechanisms to prevent exclusionary outcomes. Without targeted monitoring, policies risk reinforcing digital privilege. Singh (2025) further underscores that linguistic diversity in India poses significant challenges for digital content delivery, as many platforms prioritize dominant languages, marginalizing learners from vernacular backgrounds.

The COVID-19 pandemic serves as a pivotal moment in the literature on digital education. School closures worldwide necessitated rapid transitions to online learning, exposing systemic vulnerabilities (Shrivastav et al., 2025; Sen et al., 2025). In India, Tewathia et al. (2020) document stark disparities in device ownership and internet access, particularly among rural households. The reliance on smartphones, often shared among family members, constrained students' ability to participate in synchronous learning activities. Mhaske et al. (2025) and Haque et al. (2025) observe that economically disadvantaged students experienced learning losses due to limited digital access and reduced teacher interaction. Gendered dimensions of exclusion also became more visible, as socio-cultural norms in certain communities restricted girls' access to digital devices (Kumari&Tiwari, 2025; Balarabe, 2025). These findings reinforce the argument that digital inequality is intertwined with broader patterns of social marginalization.

Globally, Tang and Aldrich (2026) report similar trends, noting that the pandemic exacerbated third-level digital divides, where differences in digital competence translated into divergent educational outcomes. Wan et al. (2026) further emphasize that digital resilience depends not only on infrastructure but also on institutional preparedness and pedagogical adaptability.

Beyond infrastructure, the literature underscores the critical role of digital literacy and teacher preparedness. Mertala et al. (2024) conceptualize digital competence as encompassing technical proficiency, critical thinking, and ethical engagement. In the absence of comprehensive training, teachers may struggle to integrate digital tools effectively, leading to superficial or fragmented learning experiences (Bawa&Bawa, 2025; Tariq et al., 2026). Hamilton and Pitt (2011) emphasize that digital literacy must be embedded within broader educational objectives rather than treated as an isolated skill. In India, Pillai et al. (2025) identify gaps in professional development programs, particularly in government schools, where teachers often lack sustained institutional support. Such deficiencies hinder the transformative potential of digital technologies.

Additionally, Mhaske et al. (2025) highlight that students' home environments significantly influence digital engagement. Parental education levels, digital familiarity, and socio-economic status shape learners' capacity to navigate online platforms effectively. This reinforces the argument that bridging the digital divide requires holistic interventions addressing both institutional and household factors.



The intersection of digital technology and social justice constitutes a growing area of scholarly inquiry. Ahmed (2025) frames digital inequality as a manifestation of structural violence, wherein marginalized groups systematically experience reduced access to educational opportunities. Similarly, Moghayedi (2025) calls for critical digital pedagogy that foregrounds equity and participatory inclusion. Kulal et al. (2024) and Singh (2025) emphasize that caste-based and regional disparities must be central to digital policy analysis in India. Without explicit recognition of these structural dimensions, digital reforms risk perpetuating exclusion. Shalaby (2025) further argues that equity-oriented strategies should integrate community participation, localized content development, and culturally responsive design.

Comparative studies by Papadopoulos and Cleveland (2023) and Tang and Aldrich (2026) demonstrate that successful digital inclusion initiatives combine infrastructure expansion with socio-cultural empowerment and institutional accountability. These models suggest that technological solutions must be embedded within broader social justice frameworks to achieve sustainable impact. Despite growing scholarship, several gaps remain. First, there is limited longitudinal research examining the long-term educational outcomes of digital interventions in marginalized communities. Second, while policy discourse frequently references equity, empirical evaluations of equity-focused initiatives are scarce (Schiavi et al., 2025; Agarwal et al., 2026). Third, the interplay between digitalization and linguistic diversity in India warrants deeper exploration, particularly in multilingual rural settings (Singh, 2025). Furthermore, Wan et al. (2026) highlight the need for interdisciplinary approaches integrating education policy, sociology, and technology studies. Such integration is essential for understanding how digital reforms intersect with structural inequality.

Collectively, the literature underscores that bridging the digital divide in contemporary India requires moving beyond infrastructure-centric paradigms toward comprehensive equity-driven frameworks. Access to devices and connectivity, while necessary, is insufficient to ensure meaningful digital inclusion. Structural inequalities rooted in caste, class, gender, geography, and language significantly shape digital engagement and educational outcomes. Policy discourse must therefore align technological innovation with social justice principles, institutional accountability, and participatory governance. In summary, existing scholarship provides a robust foundation for analyzing the digital divide as a multidimensional and structurally embedded phenomenon. However, sustained empirical inquiry and critical policy evaluation remain essential for translating digital transformation into equitable educational development.

Research Methodology

This study adopts a qualitative research approach to critically examine the digital divide in education within the broader framework of policy discourse, structural inequality, and equity challenges in contemporary India. Given that the phenomenon of digital exclusion is deeply embedded in socio-economic hierarchies, institutional arrangements, and cultural contexts, a qualitative design enables a nuanced exploration of dimensions that quantitative metrics—such as device ownership or internet penetration rates—may inadequately capture. As scholars argue, digital inequality extends beyond technological access to encompass skills, usage patterns, institutional capacity, and outcome disparities (Hamilton & Pitt, 2011; Papadopoulos & Cleveland, 2023). Therefore, a qualitative framework is particularly suited to unpacking the structural and discursive mechanisms through which digital reforms intersect with caste, class, gender, and geography in India (Kulal et al., 2024; Singh, 2025).

The research relies primarily on a critical and systematic review of scholarly literature, policy documents, and empirical studies to map patterns of digital marginalization and inclusion across rural



and urban contexts. The review incorporates interdisciplinary sources spanning education policy, sociology, digital governance, and development studies. Key sources include analyses of rural–urban connectivity gaps (Tewathia et al., 2020; Murali&Govindan, 2025), gendered digital access (Kumari&Tiwari, 2025; Balarabe, 2025), teacher preparedness and digital competence (Bawa&Bawa, 2025; Mertala et al., 2024), and policy implementation frameworks (Agarwal et al., 2026; AhmadiDehrashid et al., 2026). Additional studies addressing structural exclusion, linguistic marginalization, and socio-economic stratification (Ahmed, 2025; Haque et al., 2025; Moghayedi, 2025; Shalaby, 2025) are integrated to contextualize digital disparities within broader inequality regimes.

The Study Is Guided By The Following Objectives

1. To examine how digital policy frameworks, infrastructural capacity, and socio-economic hierarchies interact to shape educational inequalities in contemporary India.
2. To analyze the role of caste, gender, geography, language, and household capital in mediating access to and effective utilization of digital education.
3. To identify structural and institutional mechanisms through which digital reforms reproduce or challenge historical inequalities.
4. To synthesize insights from scholarly and policy literature to develop a comprehensive and equity-oriented understanding of digital transformation in Indian education.

Data collection involved the systematic extraction and coding of information from peer-reviewed journal articles, government reports, multilateral policy briefs, and empirical case studies conducted across diverse regions of India. Particular attention was given to studies examining pandemic-induced educational disruptions (Shrivastav et al., 2025; Sen et al., 2025; Mhaske et al., 2025) to understand how crisis conditions intensified digital inequalities. Additionally, comparative and international perspectives (Tang & Aldrich, 2026; Wan et al., 2026; Schiavi et al., 2025) were incorporated to contextualize India's experience within broader global discussions on digital inclusion and educational equity. The review process followed a structured three-stage approach: identification of relevant literature through database searches using targeted keywords, screening based on relevance, methodological rigor, and contextual applicability, and systematic extraction of key concepts, arguments, and empirical findings. These were then organized into analytical categories to ensure clarity and coherence. The study adopted thematic content analysis as its primary analytical framework, enabling the identification of recurring patterns and critical issues. Core themes included access to digital infrastructure, socio-economic disparities, policy effectiveness, regional imbalances, and the role of governance in shaping equitable digital education outcomes.

1. **Infrastructural Inequality** (connectivity, electricity, device availability) (Tewathia et al., 2020; Murali&Govindan, 2025);
2. **Digital literacy and Pedagogical Capacity** (teacher training, digital competence, curriculum integration) (Mertala et al., 2024; Tariq et al., 2026);
3. **Intersectional Vulnerabilities** (gendered access, caste-based exclusion, rural marginalization) (Kulal et al., 2024; Kumari&Tiwari, 2025);
4. **Policy Discourse versus Implementation Gaps** (Agarwal et al., 2026; Moghayedi, 2025);
5. **Outcome Disparities and learning losses** (Tang & Aldrich, 2026; Wan et al., 2026).



Through iterative comparison and synthesis, the analysis highlights both macro-level structural patterns and micro-level localized experiences of exclusion. This interpretive framework allows for the identification of tensions between policy aspirations of digital democratization and empirical evidence of stratified access and outcomes.

Importantly, the study adopts a critical social justice lens, recognizing that digital inequality is not merely a technical issue but a manifestation of deeper socio-political structures (Ahmed, 2025; Shalaby, 2025). By foregrounding caste, gender, class, and regional disparities, the methodology situates digital education reforms within broader frameworks of distributive justice and institutional accountability. The integration of comparative perspectives (Papadopoulos & Cleveland, 2023; Tang & Aldrich, 2026) further strengthens the analytical rigor by identifying transferable lessons and contextual distinctions.

The objectives guiding this methodology are twofold: first, to critically map how digital policy, infrastructural capacity, and socio-economic hierarchies intersect to create differentiated educational outcomes in India; and second, to explore the ways in which gendered norms, linguistic diversity, rural–urban divides, and institutional readiness mediate processes of digital inclusion and exclusion. By prioritizing a qualitative, literature-driven approach, this research provides a comprehensive understanding of the structural mechanisms and policy dynamics shaping digital inequality in Indian education. In sum, this methodological design enables a holistic and critical examination of the digital divide as a multidimensional and structurally embedded phenomenon. Rather than isolating technological variables, the study situates digital transformation within broader socio-economic, cultural, and political frameworks, thereby contributing to equity-oriented policy discourse and academic scholarship on contemporary educational reform.

Discussion

The findings of this study reinforce the argument that the digital divide in contemporary India is not merely a technological gap but a structurally embedded form of inequality shaped by socio-economic hierarchies and policy design. Consistent with Hamilton and Pitt (2011) and Papadopoulos and Cleveland (2023), the analysis demonstrates that access to devices and connectivity represents only the first layer of digital inclusion. While policy discourse frequently emphasizes infrastructural expansion and platform-based solutions (Agarwal et al., 2026), empirical evidence indicates that second- and third-level divides—digital literacy, pedagogical capacity, and differential learning outcomes—remain deeply stratified (Tang & Aldrich, 2026; Wan et al., 2026).

The discussion highlights that rural–urban disparities, caste-based exclusion, and gendered norms significantly mediate digital access and utilization. Studies documenting rural connectivity deficits (Tewathia et al., 2020; Murali&Govindan, 2025) align with the present analysis, which finds that infrastructural gaps continue to disadvantage government school students and marginalized communities. Furthermore, gendered patterns of digital access (Kumari&Tiwari, 2025; Balarabe, 2025) reveal that digital reforms may inadvertently reinforce patriarchal norms unless accompanied by targeted equity measures. These findings support Ahmed’s (2025) contention that digital transformation can reproduce structural violence if underlying socio-cultural hierarchies are left unaddressed. Another critical insight concerns the policy–implementation gap. Although national initiatives advocate inclusive digital governance, localized institutional capacity often remains insufficient (Moghayed, 2025; Schiavi et al., 2025). Teacher preparedness and digital competence, as emphasized by Mertala et al. (2024) and Bawa and Bawa (2025), emerge as central determinants of meaningful integration.



Without sustained professional development and context-sensitive curricular design, technological tools risk superficial adoption rather than transformative learning. Overall, the discussion underscores that bridging the digital divide requires an integrated social justice framework. Digital policy must move beyond infrastructure-centric paradigms toward participatory governance, intersectional targeting, and accountability mechanisms. Only by aligning technological innovation with structural reform can India ensure that digital education contributes to equitable and sustainable development (Kulal et al., 2024; Sen et al., 2025; Pillai et al., 2025).

Conclusion

This study has critically examined the digital divide in education within the broader framework of policy discourse, structural inequality, and equity challenges in contemporary India. The analysis demonstrates that digital exclusion is not merely a technological deficit but a multidimensional and structurally embedded phenomenon shaped by caste, class, gender, geography, and institutional capacity. While policy initiatives increasingly emphasize digital transformation as a pathway toward democratizing education and fostering national development (Agarwal et al., 2026), the evidence suggests that infrastructural expansion alone cannot guarantee equitable outcomes. Consistent with layered models of digital inequality (Hamilton & Pitt, 2011; Papadopoulos & Cleveland, 2023), the divide persists across access, skills, usage, and learning outcomes.

The findings underscore that rural–urban disparities, linguistic diversity, and socio-economic stratification significantly mediate the effectiveness of digital reforms (Kulal et al., 2024; Singh, 2025). Despite improvements in connectivity, marginalized communities continue to face constraints related to device availability, unreliable internet infrastructure, and limited digital literacy (Tewathia et al., 2020; Murali&Govindan, 2025). Moreover, gendered patterns of access reveal how socio-cultural norms intersect with technological inequalities, disproportionately affecting girls and women in certain regions (Kumari&Tiwari, 2025; Balarabe, 2025). These dynamics highlight the importance of intersectional policy frameworks that explicitly address structural vulnerabilities. The COVID-19 pandemic further illuminated the fragility of digital preparedness within India's educational system. Learning disruptions exposed deep inequalities in institutional readiness, teacher training, and household digital capacity (Shrivastav et al., 2025; Sen et al., 2025). As the discussion indicates, teacher competence and pedagogical integration remain central to meaningful digital engagement (Mertala et al., 2024; Bawa&Bawa, 2025). Without sustained professional development and context-sensitive curriculum design, digital tools risk reinforcing passive consumption rather than fostering transformative learning.

Importantly, this study argues that bridging the digital divide requires a shift from technology-centric governance to equity-driven and participatory models of reform. Digital inclusion must be embedded within broader social justice frameworks that prioritize distributive equity, accountability, and localized implementation (Ahmed, 2025; Moghayedi, 2025). Comparative insights (Tang & Aldrich, 2026; Wan et al., 2026) suggest that sustainable digital transformation depends on integrating infrastructural investment with socio-cultural empowerment and institutional capacity building. In conclusion, achieving digital equity in Indian education demands a holistic reimagining of policy and practice. Addressing structural inequality, strengthening institutional readiness, and fostering inclusive digital literacy are essential to ensuring that technological innovation translates into substantive educational justice. Only through such integrated and intersectional approaches can digital transformation contribute to inclusive, resilient, and sustainable educational development in contemporary India (Pillai et al., 2025; Sen et al., 2025).



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