International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

The Economics of Being Left Behind: Digital Literacy and Inequality in a Changing World

Advay Jalan

The International School, Bangalore, Karnataka, India

Abstract: ***The digital divide in India today is no longer just about access to devices or internet connectivity-it's about survival, participation, and dignity in an increasingly digitized world. This article delves deep into how digital exclusion, especially among marginalized groups, is structurally embedded in social, economic, and educational inequalities. Rather than offering a generic summary, the research highlights how digital literacy-not as a static skillset, but as a living, evolving capability-has become indispensable for modern citizenship and economic resilience. What's striking is the multi-layered nature of exclusion, shaped by gender, caste, geography, and class, where the digital world opens doors for some and solidifies walls for others. Drawing from robust secondary data across Indian and Global South contexts, the analysis moves beyond surface metrics to uncover how policy gaps, cultural barriers, and infrastructural inequities intersect to keep millions digitally alienated. This suggests that digital literacy is no longer a luxury or an add-on but a fundamental right-one that demands rethinking policy through an intersectional lens. The article makes a compelling case that unless digital literacy is fully woven into education, livelihoods, and public service systems, digital empowerment will remain symbolic, not transformative. It is evident that achieving true digital inclusion requires more than distributing technology; it calls for targeted, context-sensitive, and equity-driven interventions that prioritize capability, confidence, and community-led change.***

Keywords: digital exclusion, digital literacy, socioeconomic inequality, rural India, intersectional policy

1.Introduction & Context of Study

The breakneck technological revolution of the decade past has totally reworked social, educational, and economic spheres worldwide (Maria Isabel Ribeiro et al., 2023). And yet, amidst unprecedented technological progress, the phenomenon of digital exclusion-systemic insufficiency to access, understand, and utilize digital instruments-has emerged as a major handicap for millions, particularly in emerging economies like India (Nirmani I.A.P., 2025). Digital exclusion is not just a question of internet connectivity or device possession; it is the critical skills shortage that prevents people from engaging fully with digital interfaces.

Digital literacy is the ability to find, evaluate, utilize, share, and create digital content by means of digital technologies (UOTP MARKETING, 2022). Digital literacy is different from simple internet access or mobile phone ownership because it entails both know-how and confidence in using digital systems to accomplish activities such as banking, e-learning, job hunting, or even public services (ibid, 2025). The COVID-19 pandemic hastened these divides, highlighting starkly the point that digital skills have become the minimum requirement for participation in society and the economy (De et al., 2020). Thus, understanding digital exclusion and its economic implications is not a matter of theory; it is a social imperative.

Studies suggest digital exclusion by caste remains widespread in India and that lower castes have much lower digital access and literacy even when education and income are held constant. Moreover, empirical evidence suggests digital literacy training in rural India enhances socioeconomic outcomes reaffirming the skills argument over simple connectivity (Nirmani I.A.P., 2025). Economic stability is also closely connected withclosing down the digital divide in India since ICT access and digital skills are linked with greater participation in digital economic activity (Modi & I. Lazanyuk, 2025).

The Importance of Digital Literacy in Contemporary Society

In the world today, digital literacy is a foundation of economic engagement, educational access, and social participation. As commerce, public services, and school systems become increasingly online, digital literacy is as vital as literacy and numeracy in daily life (UOTP MARKETING, 2022). The pandemic's forced move to remote learning and employment merely hastened the process, revealing deep disparities in preparedness between people and places (De et al., 2020).

At the global level, digitally empowered citizens have better job prospects, easier access to financial services, better health and governance (Modi & I. Lazanyuk, 2025). In India, where digital platforms are the hub of initiatives like Digital India and Aadhaar, being behind means missing out and increasing disparities. Having the ability to harness digital technology has become a sine qua non for education, work, and economic citizenship (Nirmani I.A.P., 2025).

However, whereas what makes digital literacy different from traditional literacy is its dynamic, constantly changing character; it is not a static set of skills but an ongoing process of learning fueled by new technologies, shifting platforms, and changing norms of communication and information processing (Rani, 2025). This constant evolution demands not only cognitive flexibility but also socio-emotional resilience to adjust, especially among disadvantaged populations with multiple challenges like poverty, language, and infrastructure deficits (Sanders, 2021). Further, digital literacy is more than a set of functional competencies-like owning a smartphone or writing an email-and demands the capacity to manage disinformation, protect digital privacy, and understand the ethical implications of digital behavior (Ma, 2023; Ilomäki, 2023).

An educated population of the digital kind is required to foster democratic engagement. With governments turning more and more towards digital media for spreading information, election administration, and opinion polls, a lack of digital literacy represents a huge barrier to participatory governance (OECD, 2025; Shin, 2024). Unless checked, the digital literacy gap can become the basis for a new kind of structural imbalance-where information, entitlements, and opportunities will be hierarchically dispensed based on one's capability to interface meaningfully with digital systems (Sanders, 2021; OECD, 2025).

2.Research Methodology

To examine the economic consequences of digital exclusion, this research employs a secondary data analysis strategy, drawing on academic scholarship, government reports, and Indian and comparative Global South case studies. This is an appropriate strategy for many reasons. First, it facilitates triangulation across a range of datasets, making conclusions more robust. Second, in drawing upon established, peer-reviewed sources and official reports, the research is founded upon tested evidence, avoiding the difficulties of primary data collection under the impact of ongoing disruptions like those of COVID-19.

Government reports, like those of India's Ministry of Electronics & IT, and international organizations (e.g., UNESCO), offer comprehensive information on trends in digital access, literacy rates, and their economic impacts. Further, recent case studies reflect the day-to-day life of digital exclusion in cities and rural contexts.

Drawing on a range of high-quality secondary sources, the study offers a rich and nuanced understanding of the dynamics of digital exclusion in different socioeconomic contexts. This approach is especially useful in the analysis of a problem like digital exclusion, which is closely tied with a variety of social determinants, such as education, gender, income, and geography-factors that are easily accessible in national and international datasets. In addition, secondary data analysis allows the analyst to be able to undertake a historically located analysis, to identify trends and policy developments over time, which would be difficult to do through the use of primary research methods alone.

The selection of Indian and Global South case studies is to locate digital exclusion not as especially national in scope, but as a common problem of developing economies of high-speed technological change without concomitant infrastructure expansion. The consistency of government and intergovernmental data, along with academic assessments, makes possible more sophisticated and analytically demanding examination of the structural determinants that lead to digital marginalization.

Digital Literacy as an Economic Imperative

21st-century inclusion in the economy is inextricably linked to digital literacy. Indian and other employers increasingly demand digital literacy, not just in office-based work but also in the old economy sectors of agriculture, retail, and logistics (Rani, 2025; De', Pandey, & Pal, 2020). In effect economic transactions-banking, bill paying, access to welfare payments from the government-have migrated online (UOTP MARKETING, 2022). For the unskilled, digital illiteracy renders simple tasks insurmountable hurdles, lowering productivity and locking people into poverty traps (Nirmani, 2025; Sanders, 2021). Furthermore, digital exclusion constrains educational attainment: students who don't have access or capability to use education technology lag behind, with further implications for their workforce readiness and earning potential (Ilomäki, 2023). Macro-economically, the overall impacts stifle national economic development, innovation, and competitiveness (Ribeiro, Rêgo, Lopes, & Fernandes, 2023).

The shift towards a digital economy has deeply changed the employment criteria; it has also reshaped the notion of employability in the 21st century (Shin, 2024). Core skill in the use of digital tools is now seen as a must, even for those at the lower level of the hierarchy (OECD, 2025). As a result, the digitally marginalized face a rising disadvantage in labor markets already facing stress from automation and globalization (Modi & Lazanyuk, 2025). In the unorganized and rural economy, where India's largest workforce is located, lack of digital literacy only aggravates existing productivity gaps (Nirmani, 2025). Those who do not have access to agricultural market prices, meteorological information, or government subsidy websites remain reliant on intermediaries, to their economic detriment (Rani, 2025).

A mounting body of research indicates that digital literacy is a key component of the entrepreneurial competencies of small-scale entrepreneurs, artisans, and gig economy workers, which allows them to use e-commerce websites, mobile banking, and digital payment platforms (Ma, 2023; Sanders, 2021). Hence, the promotion of digital skills among economically marginalized communities transcends the provision of technology itself and is a question of economic justice. To acknowledge digital literacy as a matter of economic necessity is to accept it as a basic economic need and as a force of socioeconomic progress (Ribeiro et al., 2023). The reality to this is the fact that ignoring the problem of digital exclusion is tantamount to calling for long-term structural inequalities in the labor market. Closing the gap requires persistent public spending, inclusive education, and outreach initiatives that are situation-based (OECD, 2025; Rani, 2025).

Digital Literacy Inequality of Access

Digital literacy is not equally distributed. Rural and semi-urban areas, women, elderly people, and socioeconomically deprived groups are disproportionately affected by poor digital access and literacy (Nirmani, 2025; Rani, 2025). In India, only slightly more than one-quarter of the populace is digitally literate, and there are widespread interstate and regional differences. The digital divide between urban and rural is stark, as infrastructure shortages and chronic lack of educational inputs contribute to deeply entrenched social disparities (Ribeiro, Rêgo, Lopes, & Fernandes, 2023; OECD, 2025). Digital exclusion is a reflection of already established stratifications, resulting in the marginalization of disadvantaged groups from the economy, public services, and social networks. The drivers-infrastructure deficit,

affordability, and educational deficit-are chronic barriers that cannot be resolved by mere connectivity interventions (UOTP MARKETING, 2022; Ilomäki, 2023).

Such inequalities are not haphazard but are inherent within larger socio-political systems that reproduce marginality. Rural schools, for example, frequently do not only lack access to the internet but also electricity, computer labs, or certified digital teachers-so even limited use of technology is a luxury (Nirmani, 2025; Rani, 2025). Access to devices and information is class- and caste-mediated, such that economically disadvantaged and lower-caste families will prioritize survival over digital infrastructure. And this has a cascading impact: absence of initial access produces digital alienation, which in turn is equivalent to limited employability and social immobility (Modi & Lazanyuk, 2025; Darvin, 2024).

The accounts of digital development often exclude elderly persons. Their exclusion from telemedicine, online banking, and social security updates worsens their social isolation and economic dependency (Sanders, 2021). Also, engaging in digital inclusion as a technical only solution-i.e., handing over tablets or SIM cards-is short-sighted to the deep pedagogy and social work needed to render them accessible and meaningful (Ilomäki, 2023). Digital inequality here is not just infrastructural deficiency but also involves differences in agency. A just digital future depends not just on access equality but also on the ability to use digital tools on one's own terms.

Gendered and Class-Based Digital Divides

The Indian digital divide is strongly gendered and class-based. Indian women are far less likely than men to own a smartphone or access the internet alone, often due to patriarchal social norms, lower education levels, and home surveillance (Nirmani, 2025; Rani, 2025). Women living in poor households have digital exclusion add to their underlying vulnerabilities, limiting employment opportunities, health information, and even rights and entitlements (Sanders, 2021; Modi & Lazanyuk, 2025).

Class disparities also determine the impact of digital literacy. As urban middle-class teenagers learn more about new technology, their rural or poor counterparts might never receive even rudimentary training, let alone advanced digital literacy (Ilomäki, 2023; Ribeiro, Rêgo, Lopes, & Fernandes, 2023). These disparities are then magnified during a crisis such as the pandemic, locking out the most excluded from the life-saving networks. This intersection of class and gender does more than postpone participation online-it reorders the experience of technology itself. For working-class people and most women, the internet is accessed through the intermediacy of gatekeeping, where control of devices and presence online are frequently exercised by others (Sanders, 2021; Nirmani, 2025).

In poor households, even if they own a smartphone, women are the last to use the phone-typically under supervision and for a limited scope. This limitation prevents them from engaging in discovery, self-learning, or acquiring confidential health and legal information (UOTP MARKETING, 2022; Rani, 2025). Educational disparity is present for the purpose of perpetuating this marginalization; male high-income students tend to be enrolled in coding or robotics classes, while low-income female students tend to have poor attendance at school, let alone receive formal digital education (Ilomäki, 2023; Modi & Lazanyuk, 2025).

The combined effect shows up as a gendered difference in use as well as a profound cognitive gap in terms of digital confidence and creativity. These are the specific differences that grow greater with more time, so that inequality is reproduced in subsequent generations. What then arises is a strong imperative to turn digital literacy policy in an intersectional direction. Increasing access alone, without challenging the underlying norms that limit use in women and among low-income groups, will not constitute empowerment. Rather, initiatives for furthering digital inclusion will need to take on board cultural sensitivity, gender understanding, and class awareness in their design and implementation approaches (OECD, 2025; Sanders, 2021).

Widening Inequality in Indian Education After COVID

The shift to virtual learning during and after the COVID-19 pandemic cemented pre-existing inequalities in the Indian education system. When schools closed and classes were conducted virtually, digitally disadvantaged students who lacked devices, internet, and digital literacy were left behind (De', Pandey, & Pal, 2020; Nirmani, 2025). Estimated millions of students, disproportionately represented in rural and marginalized groups, fell irretrievably behind their peers during this period (Rani, 2025; Sanders, 2021). While others in the private sector simply went online, government and poor schools fell behind due to poor infrastructure and untrained teachers in online pedagogy (Ilomäki, 2023; OECD, 2025). The outcome is a learning deficit across generations that could compound education and, by proxy, economic disparities for the next several decades (Modi & Lazanyuk, 2025).

The learning deficiency identified extends beyond academic problems alone; it actually alters long-term emotional and intellectual development, thereby impacting students' competitiveness, aspirations, and self-worth. Besides, those students who did not get to experience digital learning environments during the pandemic now have a 'double exclusion'-alienation from both conventional education and the changing digital world (Sanders, 2021). Additionally, study material for online consumption was rarely constructed to accommodate India's rural and tribal populations' cultural and linguistic diversity, so much of the children could not utilize lessons even when devices were available (Rani, 2025; UOTP MARKETING, 2022).

Low-resource school teachers were not well trained to prepare or present web-based lessons, not due to a lack of intention, but because they themselves were poorly trained in how to teach with technology (Ilomäki, 2023). This is an indicator of a larger systemic failure: technology was rolled out without first establishing the underlying human capacity to effectively use it. The assumption that technology alone would bridge educational inequalities during times of crisis

unveiled the deep depth of infrastructural and social disparities (De' et al., 2020; Ribeiro, Rêgo, Lopes, & Fernandes, 2023). It is not a deficiency in innovation that has contributed to this generation gap, but the unevenness in its implementation. India's post-pandemic recovery cannot afford to treat education as a standalone sector. If digital inclusion is not the bedrock of education policy-through teacher education, curriculum change, and targeted resource support-the harm the pandemic has caused threatens to become a permanent fixture of the education system (Nirmani, 2025; Rani, 2025).

Policy Interventions:

India has launched major digital literacy initiatives, such as the Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) and National Digital Literacy Mission, to bridge rural digital divides Rani, 2025; OECD, 2025). While these efforts have increased base digital awareness, there are wide gaps that still exist. Implementation challenges such as inadequate infrastructure, teacher shortages, and lack of localized and relevant content still persist and hinder universal digital inclusion (Nirmani, 2025; Ilomäki, 2023).

To be effective, policy must increasingly embed digital literacy into mainstream primary education, fund local digital champions, and address underlying socio-economic exclusion (Sanders, 2021; UOTP MARKETING, 2022). Public-private partnerships and community-based approaches have potential, provided they place inclusivity and accessibility at the very top of their agendas for the most excluded. It is not a technical but a profound socioeconomic problem that affects the aspirations and life-opportunities of millions (Modi & Lazanyuk, 2025).

Thus, policies must also go beyond counting numbers-such as trained individuals or distributed devices-and instead quantify lasting effects like sustained habit, retained skills, and economic mobility (Ribeiro, Rêgo, Lopes, & Fernandes, 2023). If digital literacy is not connected to livelihood means specific to context, especially in marginalized groups, it will be symbolic and not transformative.

3.Conclusion

Digital exclusion is a cause and a result of socioeconomic disparity in India and other comparable developing economies (Modi & Lazanyuk, 2025; Sanders, 2021). With digital ability becoming the more important determinant of educational success, economic chance, and active citizenship, the price of falling behind accelerates (Rani, 2025; Ma, 2023). Closing the digital gap requires addressing entrenched social and structural determinants, not access alone, to facilitate meaningful digital participation (Nirmani, 2025; OECD, 2025).

Bridging the digital divide is therefore a matter not only of technology, but of structure that needs to be addressed through a reallocation of resources, a rethink of educational practice, and the existence of political will (Ilomäki, 2023; Ribeiro, Rêgo, Lopes, & Fernandes, 2023). Digital literacy cannot be a standalone initiative; instead, it needs to be mainstreamed into school education, adult education, vocational education, and public service provision (UOTP MARKETING, 2022; OECD, 2025). The strategy needs to be intersectional, attuned to particular local context and informed by the realities of the community.

Most importantly, the goal is not merely to get individuals to use technology, but to become active, thinking citizens of digital societies. Only then does digital citizenship and digital societies amount to a type of democratic participation and socioeconomic empowerment. A more inclusive digital future is not only an option-it is an obligation.

References

[1] De', R., Pandey, N., & Pal, A. (2020). Impact of digital surge during Covid-19 pandemic: A viewpoint on research and practice. *International Journal of Information Management, 55*, 102171. https://doi.org/10.1016/j.ijinfomgt.2020.102171
[2] Ilomäki, L. (2023). Critical digital literacies at school level: A systematic review. *Review of Education, Pedagogy, and Cultural Studies, 45*(2), 234–258.
[3] Ma, S. (2023). Are digital natives overconfident in their privacy literacy? Subjective and objective privacy literacies among Chinese youth and their impact on protection behavior. *Journal of Digital Youth & Privacy, 8*(3), 112–128.
[4] Modi, S., & Lazanyuk, I. (2025). A study on impact of digital inequality on economic stability in India. *Proceedings of ICEIP 2025*, 431–441. https://doi.org/10.63550/iceip.2025.83.66.001
[5] Nirmani, I. A. P. (2025). Barriers to digital participation in developing countries: Identifying technological, social, and cultural obstacles to community involvement. *GSC Advanced Research and Reviews, 23*(2), 061–071. https://doi.org/10.30574/gscarr.2025.23.2.0130
[6] OECD. (2025). *Action plan on transforming public governance for digital democracy*. OECD Publishing.
[7] Rani, P. G. (2025). Digital literacy: How it has been evolving? Its significance in the Indian context. *Modern Economy, 16*(4), 655–680. https://doi.org/10.4236/me.2025.164031
[8] Ribeiro, M. I., Rêgo, C., Lopes, I., & Fernandes, A. (2023). Impact of technology revolution on economic development over the past decade. In *Communications in Computer and Information Science* (pp. 485–501). https://doi.org/10.1007/978-3-031-48930-3_37
[9] Sanders, C. K. (2021). The digital divide is a human rights issue. *Journal on Human Rights & Technology, 9*(1), 1–9.
[10] Shin, B. (2024). A systematic analysis of digital tools for citizen participation. *Technology in Society, 68*, Article 101738.
[11] UOTP MARKETING. (2022, October 26). What is digital literacy and why is it important? *University of the Potomac*. https://potomac.edu/what-is-digital-literacy/