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Digital Literacy among Adults in Rural India: Status, Challenges, and Structural Determinants

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Abstract

Digital literacy is increasingly essential for social inclusion, economic participation and civic engagement in twenty first century India. However, while 425 million rural Indians use smartphones (WEF, 2023), only 24% of rural adults possess basic digital skills (NSS report, 2022), a 32-percentage-point gap compared to urban adults. This article explores the status of digital literacy and access, its structural determinants, and gender differences in access among rural adults in India based on secondary research using the NSS (2022), ASER 2023 and 2024, TRAI Telecom Statistics (2023), NFHS-5 (2019-21), Oxfam India Inequality Report (2022), GSMA Mobile Gender Gap Report (2024), and official PMGDISHA program data from MeitY, 2024. These findings reveal the long-lasting and multidimensional digital divide caused by poor infrastructure, socio-cultural perceptions, economic inequities, and a lack of appropriate pedagogies and highlight the need to move beyond event-based digital skills training models, towards community-integrated digital learning ecosystems in India's adult and continuing education system.

Keywords: Digital Literacy, Rural Adults, Digital Divide, PMGDISHA, Continuing Education, Gender Gap, India.

1. Introduction

India's digital landscape is both contradictory and ironic. It is home to one of the world's largest and fastest growing mobile internet user groups and has 425 million rural mobile phone users (WEF, 2023). At the same time, according to National Sample Survey (NSS, 2022) only 24% of rural adults have basic digital skills, compared to 56% in urban. This is known as the 'second-order digital divide': the problem is no longer purely access, but the ability to use the technology in a functional, meaningful way (van Dijk, 2005).

The practical manifestations of this divide are more concrete too. The largest welfare programs of the Indian state such as distributing agricultural subsidies through PM-KISAN and online telemedicine consultations through e-Sanjeevani, are increasingly being moved online, making digital literacy a de facto precondition for the entitlements. The COVID-19 pandemic has exposed these disparities: Oxfam (2021) reports that as of May 2021, while urban India had received 30 doses of vaccine per 100 population, rural India had received 12.7 doses of vaccine per 100 population population. One reason for this disparity is vaccinations required online registration with the CoWIN distribution platform. Thus, rural digital literacy development must also be framed as a key issue of social justice and development equity, not just ICT need.

Accordingly, the present article tries to analyze, the status, structural barriers and programmatic response to digital literacy for rural adult in Indian context with a specific focus on adult learners as they are usually excluded from formal education and vocational training systems. The article situates its analysis within the field of continuing education and lifelong learning.

2. Literature Review

Over the past 30 years, the concept of digital literacy has evolved from Gilster's (1997) definition, which centers on the ability to read and interpret information in a digital environment, to a much broader definition. Lankshear and Knobel (2008) proposed a socio-cultural view of digital practices. DigComp 2.2 defined five dimensions of digital literacy: information literacy, communication and collaboration, content creation, safety, and problem-solving, and five levels of expertise in each dimension. However, in the Indian context, what constitutes an operational definition of digital literacy, as in the case of PMGDISHA (operating digital devices, accessing the internet, using government portals, and conducting basic financial transactions), is only a functional minimum standard (MeitY, 2024).

Van Dijk (2005) develops four levels of digital divide: motivational, physical, skills, and usage access. This framework has been most analytical for India's rural digital divide, where digital interventions have targeted motivational and physical access. However, these results mask the fact that the rural adult population lags considerably on skills and usage access levels (NSS, 2022; ASER 2024). This suggests that smartphone penetration may not automatically translate into digital literacy. ASER (2024) found while 90% of rural youth aged 14-16 have access to smartphones, access to government and financial services was negligible, confirming van Dijk's (2005) access hierarchy.

International research on adult digital literacy in developing countries has found that structural barriers prevent people's use of devices. For example, gender norms that make women using devices unacceptable (GSMA, 2024), affordability of devices or data plans (Oxfam India, 2022), low baseline literacy meaning interfaces remain unintelligible (NFHS-5, 2019-21), and the mismatch between training and the competency profile required for independent long-term use of digital technology (UNESCO, 2018). An additional Indian study found that only 20.66% of rural students, compared with 69.70% of urban students, used computers for schoolwork (Kumar & Kumara, 2018). This is of particular relevance to India's national adult education system as the UNESCO SDG Target 4.4 mandates countries to substantially increase the number of adults and youths with digital skills by 2030 and the New India Literacy Programme (NILP, 2022-27) does not have a systematic digital literacy component (IDR, 2026).

3. Methodology

The research uses a systematic synthesis of secondary data from nationally representative surveys, regulatory data, and programme evaluations. The main datasets used are the NSS 75th Round Household Social Consumption Survey (2022) and the ASER Centre's national reports for 2023 and 2024, as well as the TRAI Consultation Paper No. The study relies on the 16/2023 on Digital Inclusion, the National Family Health Survey-5 (2019-2021), the Oxfam India Inequality Report, 2022, the GSMA Mobile Gender Gap Report, 2024 and MeitY-approved PMGDISHA programme results till 31 March 2024. The multi-layered structure of the digital divide is conceptualized across the dimensions of rural-urban, gender, state and socioeconomic indicators using cross-tabulation. The descriptive-comparative method of analysis highlights convergences and divergences across sources to triangulate the findings and to avoid single-source bias.

4. Findings

4.1 The Rural-Urban Divide

Numerous national surveys document the persistent rural-urban digital literacy divide. For example, a survey by TRAI in 2023 (see Table 1) saw a rural internet penetration of only 37% compared to 67% for urban areas.

Likewise, a survey by ICRIER/Statista in 2020 found rural browsing and social media penetration to be roughly half that of urban areas. These economic divides are best illustrated by computer ownership, where only 2.7% of rural households in the lowest income quintile own a computer, and only 8.9% of rural households own any type of internet access (Oxfam India, 2022).

Table 1: Key Digital Literacy and Connectivity Indicators - Rural versus Urban India

Table 1: Key Digital Literacy and Connectivity Indicators — Rural vs. Urban India

Indicator	Rural	Urban
Basic digital skills	24%	56%
Internet penetration rate	37%	67%
Internet browsing and searching	31%	66%
Social media and messaging use	27%	61%
Women using internet	24.8%	51.7%
Computer access (poorest 20% households)	2.7%	Higher

Source: NSS (2022); TRAI (2023); ICRIER/Statista (2020); NFHS-5 (2019–21); Oxfam India (2022).

4.2 State-Level Disparities

That said, the national aggregate hides considerable inter-state differences. ASER (2024) suggests that household smartphone access is nearly universal in states like Kerala, Mizoram and Sikkim (about 99%), while other states like Bihar, Odisha and Jharkhand have much lower levels. According to TRAI, Bihar has the lowest internet density (35.31%) of major states. In rural India, ASER (2024) found a proxy of the quality of the digital ecosystem (percentage of rural young people able to perform various tasks online) to be highest in Sikkim and below 50% in Rajasthan and Meghalaya. However, the distribution of digital disadvantage closely mirrors the distribution of existing Human Development Index patterns, suggesting digital literacy deficits are embedded within wider development inequalities rather than being standalone.

4.3 The Gender Dimension

India's digital divide is also driven by gender. The 2024 GSMA Mobile Gender Gap Report found a 30% gender gap in mobile internet access in India, which is double the average 15% gender gap in low- and middle-income economies. NFHS-5 2019-21 found only a third of women (37%) use the internet, versus 57% of men. 43% in a Springer Nature (2025) decomposition of 103,119 women had not heard of the internet; of 57,542 who had heard of it, 24.8% used it in rural India, and 51.7% in urban India. A national school-based survey in rural India (ASER-2022) reported that only 19.8% of girls and 43.7% of boys between 14 and 16 years had a personal smartphone; digital literacy gaps persist among adult women.

Table 2: Gender Gaps in Access and Digital Literacy in Rural India

Table 2: Gender Disparities in Digital Access and Literacy, Rural India

Gender Indicator	Women	Men
Ever used internet (overall)	33%	57%
Internet use in rural areas	24.8%	~72%
Smartphone ownership	35%	~65%
Mobile internet gender gap (India)	30% gap (India vs. 15% global avg)	Not applicable
Personal smartphone ownership (rural, aged 14–16)	19.8%	43.7%

Source: NFHS-5 (2019–21); IAMAI (2022); Policy Circle (2026); GSMA Mobile Gender Gap Report (2024); ASER (2022).

These quantitative differences are reproduced and reinforced through socio-cultural mechanisms, as UNFPA India (2023) reports that in rural India, mobile phone mobility may court criticism, with gatekeeping access by male household members being seen as a means of maintaining social order and women's moral regulation. Data from NFHS-5 (2019-2021) show that two-thirds of rural women aged 15-49 years have insufficient education (not having 10 or more years of formal schooling), making them potentially unable to use websites that presume some level of literacy.

4.4 The PMGDISHA Programme: Scale and Depth

Table 3: PMGDISHA Programme Outcomes as of 31 March 2024

PMGDISHA Metric	Outcome (as of 31 March 2024)
Target households	6 crore (60 million)
Total candidates enrolled	7.35 crore (73.5 million)
Total individuals trained	6.39 crore (63.9 million)
Total candidates certified	4.78 crore (47.8 million)
Training duration per beneficiary	20 hours across 5 modules
Languages supported	22 scheduled languages and English

Source: Ministry of Electronics and Information Technology (MeitY), Press Information Bureau (PIB), Government of India (2024).

PMGDISHA trained 6.39 crore people against 6 crore target, making it world largest digital literacy campaign (IJRISS, 2025) with a 25% drop-out rate (6.39 crore trained but only 4.78 crore certified), indicating problems with drop-outs between training and assessment and accessibility of assessment, or perhaps even with the training itself. More critically, TRAI (2023) showed a rural internet user base of only 37%. A large proportion of PMGDISHA graduates returned to places without the Internet or the required infrastructure to practice the newly acquired skills, suggesting that the programme overlapped with too many concerns of the ecosystem and was based on throughput.

5. Discussion

Synthesis of all the above sources gives rise to the conclusion that rural digital illiteracy in India is a structural complex that is produced by the intersection of infrastructural inadequacies, economic inequalities, patriarchal social organization, and pedagogical inadequacies, giving rise to what the present analysis describes as a 'multi-layered exclusion matrix'.

A major gap is in infrastructure skills. The gap between rural internet users (38.33%, TRAI 2023) and urban users (104.77%, TRAI 2023) is over 66 percentage points. While BharatNet had connected over 183,000 gram panchayats as of 2023, last mile connectivity at the household level was low (IDR, 2026). Only 35.11% of cell towers had been fibreised, compared with 90% in Thailand and 80% in Malaysia (TRAI, 2023). This infrastructure deficit means that no matter how well designed the digital skills training programs are, they are sending skills into ecosystems that cannot support them. The PMGDISHA data suggests post-training connectivity was assumed, but not present.

Caste and economic disadvantage multiply spatial disadvantage. According to Oxfam India (2022), only 4% of SC/ST households have a computer and internet connection. 60-70% of rural households are power-starved (Ministry of Power, 2023) and only 22% of rural schools have functional computer labs (UDISE+, 2023). Thus, digital illiteracy is being reproduced by institutions, which are supposed to be a space to break through this cycle of reproduction.

At program level, the 20-hour PMGDISHA training module does not correlate in intensity with the required competencies for independent engagement with digital technologies. Indeed, UNESCO (2018) highlights how the need for embedded, situated practice in upskilling approaches to adult digital literacy is a chronic challenge. Training follow-ups and refresher courses, mentorship and continued support to trainees post-certification, are absent from PMGDISHA. Many authors have reported rapid skill deterioration among trained learners due to lack of follow-up (Lankshear & Knobel, 2008). The lack of quality and retention is reflected in the 1.61 crore gap between people trained and certified.

However, the evidence also points to pathways for successful digital literacy initiatives. With over 100 million telemedicine consultations completed by 2023, e-Sanjeevani shows that use-case-based, demand-led, digital tools can drive sustained rural engagement when the service delivers clear health benefits. Internet Saathi, which has empowered 30 million rural women in 300,000 villages, and Mobile Vaani with 2 million rural users in regional languages, present successful gender-responsive vernacular community-owned solutions to overcome socio-cultural restrictions, as per NFHS-5 and UNFPA (2023) data. The Maharashtra State Rural Livelihood Mission's digital marketing training for SHG-enabled women entrepreneurs led to measurable income during the COVID-19 pandemic. This illustrates that digital literacy associated with concrete economic use-cases generates more sustainable benefits than generic training (ORF, 2021).

The NSSO (2020-21) shows that women who are digitally literate are far more likely to participate in the labor force than non-digitally literate women. When combined with an estimate by the GSMA (2024) that closing the

mobile internet gender gap in low- and middle-income countries can result in an additional USD 700 billion in GDP, a case can be made for gender-targeted digital literacy as development policy rather than just a welfare provision.

In general, these findings support van Dijk's (2005) hierarchical access model. While level 1 and 2 (physical) access are partially closed due to ubiquity of smartphones and PMGDISHA community training programs, level 3 and level 4 access barriers remain closed for most rural adults. Excluded are the skills depth and usage-ecosystem components of connectivity, device affordability, content localization and mentoring continuity. Consequently, existing policy frameworks will continue to generate impressive quantitative targets without effecting meaningful change.

6. Conclusion

Digital literacy is the key digital skill of twenty first century citizenship on par with the functional skills of literacy and numeracy. This is especially relevant for rural India where hundreds of millions of adults are forced to navigate an increasingly digitizing state architecture without requisite digital skills. This article's secondary data synthesis from NSS (2022), ASER (2023, 2024), TRAI (2023), NFHS-5 (2019-21), Oxfam India (2022), GSMA (2024) and MeitY (2024) shows that the gap in digital literacy for rural India is deep, multi-dimensional, and structurally reproduced.

One of the main programmatic successes of PMGDISHA has been its scale-up by training 6.39 crore people. But this scale without depth, and coverage without equity, has left the most marginalized adults (women, SC/ST, rural poor, and those in low-HDI states) systematically on the wrong side of the digital divide. The programme's assumption that 20 hours of training would produce lasting competency, despite the absence of post-training connectivity infrastructure or follow-up support, has demonstrably not been borne out.

India's rural smartphone base (425 million in 2021) is the world's largest potential harnessing of digital-enabled citizenship. Achieving functional, equitable, and sustainable digital literacy, serving equally women, farm or agricultural sector labor, senior citizens, and SC/ST, will require linking digital literacy to the lifelong learning architecture, a gender-transformative approach to infrastructure, access, and pedagogy, and the provision of universal infrastructure to match the ambitious goals of Digital India's governance agenda. With its proven ability to reach those on the margins of formal systems, Continuing Education and Extension is best placed to bring this about.

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