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Digital literacy in India: An overview of access and inequality

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Abstract

The present paper is an endeavour to assess the availability of digital devices and examine the digital competency in India. Secondary data have been procured from national and international reports. The data showed that the availability of mobile phones (95.3%) was found to be universal among Indian households compared to smart phone availability (59.2%). While majority of Indian households (86.3%) had internet facility within household's premises in form of Wi-Fi and mobile network. Demographic variables such as age, education, caste and income had greater influence on digital accessibility and proficiency. Further it was observed that basic ICT tasks were performed by most of Indians such as copy and move file/folder (24.3%) and using copy and paste tools (23.3%) but percentage got thinner as advanced on higher level tasks performed i.e. writing computer programmes (1.4%). A similar trend is observed in performing digital tasks such as to send or receive message (63.6%), online banking (48.9%) and also low percentages were recorded in reporting cybercrime (17.6%). This is due to low availability of digital infrastructure, language barriers, lack of awareness of using digital infrastructure, low literacy rate etc. These findings clearly indicate wide demographic gaps in availability and usability of digital devices among Indians and emphasized on the need for digital literacy in the near future.

Keywords: Digital literacy, inequality, caste, gender, digital competency, ICT skills

Introduction

The concept of literacy has been changing from ancient times to until nowadays with the advancement of technology. It began during 1970s in the domain of non-formal education offered to adults to be able to have the basic abilities of reading and writing. It is the meaning of literacy for first world countries. For the third world countries, where are still many illiterate people because only few go to the formal education, the level of literacy is used to measure the economic power and their readiness to participate in the economic involvement (Agustina 2020) ^[1]. After that literacy in non-formal education become the concern of formal education. Then it goes beyond simply writing and reading ability to critical thinking and ability to read social-cultural conditions. Lee (2007) ^[8] also stated that learning is a cultural process that involves the understanding of the social phenomena in the society. In post-industrial society where, American economic conditions had changed, also influenced the concept of literacy. Then literacy was seen as process for learners to function as good citizens that have role to develop the society for the betterment.

After that, invention of the computer and internet had totally changed the facet of literacy. Kress (2003) ^[7] stated that there is "the broad move from the now centuries-long dominance of writing to the new dominance of the image and the move from the dominance of the medium of the

book to the dominance of the medium of the screen. The term new literacy emerged with the integration of technology in education. New literacies are termed as media literacy, information literacy, multimodal literacy, new media literacy, digital literacy etc. Digital Literacy is first popularized by Paul Gilster, in a book of the same name, published in 1997. He defined it as "the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers." UNESCO explained digital literacy as it involves the confident and critical use of a full range of digital technologies for information, communication and basic problem-solving in all aspects of life. It is underpinned by basic skills in ICT, the use of computers to retrieve, assess, store, produce, present and exchange information and to communicate and participate in collaborative networks via the Internet.

With a changing global context, literacy is no longer confined to the ability to read and write text rather it increasingly involves the capacity to navigate, interpret and create meaning through digital and multimodal platforms. As societies become more reliant on information and communication technologies (ICTs), digital competency has emerged as a critical determinant of inclusion and empowerment. Moreover, it significantly impacted the social and economic development of a person. Digital

literacy is considered as significant measure to enhance the access to the job opportunities and improve their livelihood opportunities (Alkalai and Chajut 2009; Hussain and Pulpoto 2024; Wang *et al.* 2025) ^[2, 17, 23].

COVID-19 pandemic gave greater push to use digital devices especially for continuation of education. According to data from the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2020) ^[15], nearly 1.6 billion students were affected by school closures in 194 countries and many systems turned to digital means of providing education. The rapid shift to digital learning was more difficult for particular student groups, especially those from vulnerable or disadvantaged backgrounds, and for those who lacked the requisite access and infrastructure (OECD 2020). However, the challenges and lessons learned can create opportunities for more equitable and inclusive digital technology use and leads to digital era.

In India, Digital era has been started with the launch of National Digital Literacy Mission (NDLM) in 2014. It is formulated to provide IT training to 52.5 lakh people to make them digital literate persons. Now this is known as DISHA (Digital Saksharta Abhiyan). After that, Digital India programme was initiated with the vision to transform India into digitally empowered society and knowledge economy. These initiatives played crucial role in expanding digital infrastructure, enhancing online services, improving digital skills among citizens. India has seen incredible progression in various technology driven sectors such as Unified Payment Interface (UPI) and Aadhar linked various scheme and has become world's third largest economy after USA and China. A key pillar of this transformation has been digital literacy, which enabled citizens to meaningfully access and use digital services.

To strengthen digital literacy, the government has launched several targeted initiatives, including the ICT@Schools Scheme and the PMGDISHA (Pradhan Mantri Gramin Digital Saksharta Abhiyan) launched with aim to train 60 million rural households by providing basic digital skills. National Education Policy 2020 also emphasized digital education through e-learning platforms and blend learning. PMDISHA, SWAYAM, SWAYAM PRABHA, E-Pathshala, NPTEL, National Digital Library of India, PM e-Vidya, Gyan Darshan & Gyan Vani, Bharat Net, Vidya Daan, etc. are some of the Indian government initiatives to promote digital literacy across the country. Despite these schemes, digital literacy in India remains relatively low and unevenly distributed. According to National Sample Survey 78th round in 2020-21, only 38 percent households in India are digitally literate. Out of total 61 percent of them were from urban and only one fourth (25%) were from rural areas reflecting the pronounced rural urban divide. Caste wise disparities are also prominent in India. Households from General category has maximum digital literacy rate i.e. 64 percent followed by 52 percent of Other Backward Classes (OBCs). Scheduled Castes (SCs) and Scheduled Tribes (STs) are the most disadvantaged groups with 38 percent and 31 percent digital literacy respectively (Sharma 2022) ^[14]. Regional, social and caste disparities were widening the

digital divide in India. With this backdrop, the present paper has been prepared with the objectives; to access the availability of digital devices among Indians and to examine the digital competency and skills in India.

Materials and Methods

The present paper is based on secondary data procured from authenticated various national and international sources. National level sources included National Sample Survey Organization (NSSO) 78th and 80th rounds namely, Multiple Indicator Survey in India and Comprehensive Modular Survey: Telecom 2025 respectively. International sources included Oxfam report entitled "India Inequality Report, 2024". These sources provide the multidimensional perspective regarding accessibility of digital devices and digital proficiency in India. States are recognised as IT hubs in India and all are enlisted as top 10 states with highest level of digital infrastructure in India as per report i.e. State of India's Digital Economy Report, 2024. Data have been presented in tabular format to enhance clarity and accuracy were selected for the present study. Data have been analysed using various socio-economic and demographic variables such as age, education, income, caste to measure the digital inequality in India.

Results and Discussion

The results of the study are presented in two sections. Section I, presents the findings related to the availability of digital devices and internet connectivity among Indians. It examines disparities in access across socio-economic and demographic groups. Section II represents the level of ICT skills and digital competency possessed by individuals. It also assesses their ability to perform selected digital tasks, ranging from basic to advanced activities.

Availability of Digital Devices and Internet Facility by Households

Digital literacy has become indispensable skills for individuals and society (Mayberry *et al.* 2011) ^[10]. Before ensuring the digital literacy, there is necessary to have availability and accessibility of digital tools such as mobile phones, smart phones, internet facility, computer, laptop etc. among people of India. That is why, section I has examined the availability and accessibility of these digital tools in India with regional, gender and caste variations in different states of the country.

The study made an attempt to examine the digital infrastructure in Indian households. Mobile phone includes simple phones and smart phones (android and iPhone). The perusal of Table 1 highlights that majority of Indian households (95.3%) had availability of mobile phones at their homes and 59.2 percent possessed smart phones and 86.3 percent households reported to had internet facility at their household premises in form of Wi-Fi and mobile network. The findings clearly indicate that mobile phones are found to be nearly universal among Indian households whereas smartphone possession and internet facility remains comparatively limited.

Table 1: State wise percentage of households with the availability of digital devices and internet facility in India, 2025

States	Mobile Phone	Smart Phone	Internet facility
Karnataka	94.5	61.0	86.3
Maharashtra	96.5	67.9	84.7
Telangana	95.0	57.6	76.1
Gujarat	95.0	63.7	85.6
Haryana	99.1	58.0	92.5
Kerala	99.1	62.8	89.6
Tamil Nadu	93.5	52.6	71.8
Andhra Pradesh	92.6	58.8	73.3
Punjab	99.4	65.5	89.4
Rajasthan	95.0	59.7	86.8
India	95.3	59.2	86.3

Source: Comprehensive Modular Survey: Telecom 2025 (NSSO 80th round)

Note: All figures are in percentages

State wise analysis shows that households from all states had availability of mobile phones whereas smart phone penetration is comparatively low. Tamil Nadu (52.6%), Haryana (58%), Telangana (57.6%), Andhra Pradesh (58.8%) recorded lowest percentage in smart phone penetration. On the other hand, Maharashtra (67.9%) and Punjab (65.5%) had highest smart phone penetration than national average. Further the data shows that households from Haryana (92.5%) state had highest percentages in internet facility followed by Punjab (89.4%) and Kerala (89.6%). Tamil Nadu records lowest percentages among all states followed by Andhra Pradesh (73.3%) and Telangana (76.1%). It indicates the significant inter-state disparities in smartphone ownership and internet access reflecting an uneven digital infrastructure even among the IT states of India.

Accessibility of Digital Devices and Internet Facility by Persons

Data presented in Table 2 reveal the state wise distribution

Table 2: State wise percentage of persons (15 years & above) who have accessibility of digital devices and internet facility by region, 2025

States	Mobile Phone			Smart Phone			Internet Facility		
	Urban	Rural	Regional Gap	Urban	Rural	Regional Gap	Urban	Rural	Regional Gap
Karnataka	89.0	73.0	16.0	88.1	74.4	13.7	80.0	65.3	14.7
Maharashtra	78.5	65.9	12.6	89.2	79.8	9.7	83.5	65.2	18.3
Telangana	86.3	69.9	16.4	86.2	66.8	19.7	86.1	60.5	25.6
Gujarat	76.3	61.9	14.4	88.7	77.8	10.9	76.8	65.2	11.6
Haryana	82.7	68.9	13.8	82.2	79.0	2.3	79.1	69.8	9.3
Kerala	89.0	87.8	8.2	84.5	79.8	4.7	80.2	75.5	5.0
Tamil Nadu	81.7	73.8	7.9	79.9	68.6	11.3	72.8	59.0	13.5
Andhra Pradesh	81.6	65.8	16.1	87.2	72.1	15.1	81.6	62.5	18.8
Punjab	85.4	71.2	14.2	87.9	78.9	9.3	83.7	68.6	15.0
Rajasthan	79.8	61.2	18.6	89.5	76.2	13.3	84.4	65.6	19.1
India	81.2	64.6	16.6	85.9	76.0	9.6	79.9	64.9	15.0

Source: Comprehensive Modular Survey: Telecom 2025 (NSSO 80th round)

Note: All figures are in percentages

Gender wise Ownership of Smart Phones

Social change led by technology revolution and technology is determiner of human acts. The social construction of technology argues that human actions shape the technology means technology is a product of social, political, economic and cultural environment in which it is situated (Leonardi and Barely, 2010, Buruns *et al*, 2016, Humphreys, 2005) [9]. It is evidenced in Indian context where women's

of persons who had ownership of mobile as well as smart phones and also internet facility across urban and rural regions in India. It also depicts the rural urban divide in possessing the digital devices. Data divulge that mobile ownership in urban areas stood at 81.2 percent as against 64.6 per cent in rural areas, showing a 16.6 percentage point regional gap at national level. Tamil Nadu (7.9%) and Kerala (8.2%) showed the lowest regional gap in mobile phone possession, while Rajasthan (18.6%), Andhra Pradesh (16.1%) and Karnataka (16%) recorded wider gaps reflecting unequal access to mobile phone.

Regarding smart phone ownership, it was disclosed that urban penetration (85.9%) was higher comparatively to rural penetration (76%) reflecting 9.6 percentage point regional gap. State wise analysis show that Haryana (2.3%) and Kerala (4.7%) had lowest regional gap. On the contrary, Telangana (16.4%), Andhra Pradesh (16.1%) and Karnataka (16%) exhibit the higher regional gap indicating higher rural urban divide. Further the data demonstrate the most pronounced regional disparity in terms of internet facility. At national level, 79.9 percent urban people had internet facility as compare to 64.9 percent rural people resulting 15 percentage point regional gap. State wise analysis reveal that Telangana (26.6%) and Rajasthan (19.1%) depicted the highest regional gap widening the inequality in digital connectivity. Conversely, Kerala and Haryana recorded lowest regional gap demonstrating relatively inclusive internet access. Though, ownership of mobile and smart phone had expanded across states, but rural areas still lagged behind urban areas specifically in internet facility due to poor network infrastructure. This was supported by ITU report (2019) and the study by Hussain and Phulpoto (2024) [17] where they stated that rural and urban areas gap in internet facility were considerable in many developing countries.

independent and active use of social media is viewed as a threat to prevailing gender social norms, especially those pertaining to sexuality, resulting in household and social controls on women's use of mobile phones (Kovacs, 2017) [6]. Gurumurthy and Chami (2018) [4] found that 37 percent rural women and 67 percent urban women had access to smart phones. Therefore, the present paper analysed the gender gap to examine the women access to digital tools.

Table 3 presents the gender wise distribution of persons who had smart phones across urban and rural areas in the states of India. At national level, the gender gap in smartphone ownership appears minimal i.e. 1.9 percentage point however, a closer examination across rural and urban segments reveals substantial disparities, especially in rural areas where the gap remains significantly high. For instance, significant percentages of urban males (90%) had ownership of smart phones as compared to 71.8 percent of urban females, reflecting 18.3 percentage point gender gap. But the disparity is considerably wider in rural areas where smart phone ownership among rural males stands at 80.7 percent as against the 48.4 percent of rural female, resulting into 32.3 percentage point gender gap. The wider regional gap in accessibility to smart phones might be due to the fact

that greater percentage of rural women either are homemakers or involved in agricultural and allied activities. They might not feel a strong need for smartphones or the internet because their daily work involves limited use of digital devices.

State wise analysis discloses that all states, mentioned in table, recorded lowest gender gap in urban areas regarding ownership of smart phone except Punjab and Telangana where gender gap is observed 14 and 7.5 percentage point respectively. On the contrary, gender gap is most pronounced in rural areas of all states, but again Punjab records highest gender gap i.e. 23.8 percentage point followed by Telangana with 12.3 percentage point. Thus, gender gap is prominent in all states of India irrespective of its status of IT hubs.

Table 3: Gender wise percentage of persons (15 years & above) who have only smart phone, 2025

States	Urban			Rural			India		
	Male	Female	Gender gap	Male	Female	Gender gap	Male	Female	Gender gap
Karnataka	90.0	86.1	3.9	76.6	71.3	5.3	82.3	78.8	3.5
Maharashtra	90.4	87.8	2.6	81.7	76.2	5.5	86.0	83.3	3.3
Telangana	89.7	82.2	7.5	71.7	59.4	12.3	80.4	71.9	8.5
Gujarat	89.3	87.5	1.8	78.6	76.1	2.5	84.5	82.8	7.7
Haryana	83.0	81.3	1.7	80.3	76.9	3.4	81.5	79.1	8.4
Kerala	92.1	86.1	6.0	91.8	84.5	7.3	84.4	79.7	4.7
Tamil Nadu	82.1	77.2	4.9	71.6	64.9	6.7	76.7	70.8	6.2
Andhra Pradesh	89.0	84.9	4.4	75.4	66.9	8.8	80.3	74.4	5.9
Punjab	91.7	77.7	14.0	82.3	58.5	23.8	83.3	82.5	0.8
Rajasthan	91.1	86.8	4.6	78.1	72.7	5.4	82.3	77.7	4.6
India	90.1	71.8	18.3	80.7	48.4	32.3	80.3	78.4	1.9

Source: Comprehensive Modular Survey: Telecom 2025 (NSSO 80th round)

Note: All figures are in percentages

Gender wise Usage of Internet

The scrutiny of Table 4 divulges about usage on internet at least once in last three months prior to date of survey among males and females (15 years and above) across urban and rural India. Data show that males outnumbered females in usage of internet in urban and rural India reflecting 11.5 and 14.5 percentage point gender gap respectively. A closer look reveal that rural India recorded lowest percentage of males (73.1%) and females (57.6%) in using internet as compare to urban India (75.5% males and 74% females). State wise analysis reveals that internet usage among males and females had comparatively low percentage in Tamil Nadu in both urban (79.3% and 66.1% respectively) and rural areas

(65.8% and 52.5% respectively). It is indicating the inequality related to infrastructural and regional development disparity in India. Further data demonstrate that internet usage gender gap is highest in Gujarat (17.1%) followed by Punjab and Tamil Nadu with 13 percentage point gap each. Kerala and Telangana are showing lowest gender gap with 6.0 and 7.7 percentage point respectively. On the contrary, Telangana recorded highest gender gap i.e. 20.4 percentage point in rural areas followed by Maharashtra and Haryana each with 18 percentage point gender gap in rural areas. Punjab noted 8 percentages point gender gap in urban as well as in rural area reflecting a decreasing urban-rural divide in digital era.

Table 4: Gender wise percentage of persons (15 years & above) who used internet at least once in last three months, 2025

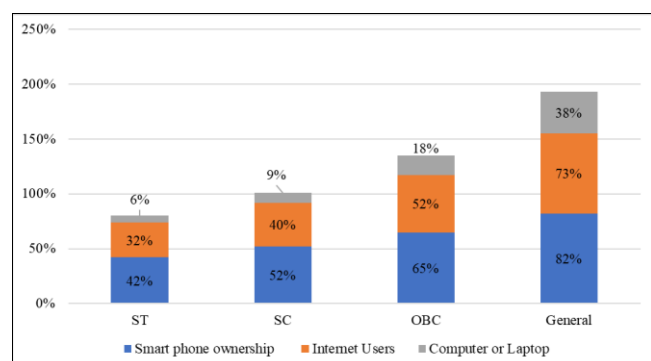
States	Urban			Rural		
	Male	Female	Gender gap	Male	Female	Gender gap
Karnataka	90.3	80.0	10.3	73.4	57.1	16.3
Maharashtra	89.1	77.6	11.5	73.7	55.7	18.0
Telangana	90.0	82.3	7.7	71.1	50.7	20.4
Gujarat	84.8	67.4	17.1	74.3	56.1	18.2
Haryana	84.5	73.1	11.4	79.0	60.3	18.7
Kerala	83.3	77.3	6.0	80.9	71.1	9.8
Tamil Nadu	79.3	66.1	13.2	65.8	52.5	13.3
Andhra Pradesh	86.4	77.1	9.3	70.9	54.5	16.1
Punjab	87.3	79.3	8.0	71.8	63.8	8.0
Rajasthan	90.3	77.0	13.3	74.3	56.7	17.6
India	85.5	74.0	11.5	72.1	57.6	14.5

Source: Comprehensive Modular Survey: Telecom 2025 (NSSO 80th round)

Note: All figures are in percentages

Caste wise Accessibility of Digital Devices and Internet Facility

Caste system is rooted in Indian social structure. Upper caste groups historically and contemporarily possess social, economic, education and political advantages over lower caste groups resulting in persistent and institutional forms of inequality. With implementation of the Constitution, various programmes, policies and practices, lower caste groups have enhanced their status with educational attainment and economic opportunities. But still facing discrimination on various level in digital era which is evident from data presented in Figure 1. It is observed that majority (82%) of General category households owned smart phone, 73 percent had internet facility and 38 percent had computer at their homes exhibiting strong socio-economic position. It is followed by Other Backward Classes (OBCs) which show moderate access to digital devices (65% smart phone ownership, 52% internet facility and 18% computer access). In contrast, Scheduled Castes (SCs) and Scheduled Tribes (STs) recorded comparatively lower percentages in possessing smart phone (52% and 42% respectively), internet (40% and 32% respectively) and very low percentages in computer (9% and 6% respectively). Thus, it is explicit caste based digital divide in India and also historical social stratification continue to shape the digital inclusion in India. Further It is becoming greater hindrance in achieving 'Viksit Bharat' vision.



Source: Oxfam: India Inequality Report, 2024

Fig 1: Caste wise accessibility of digital devices and internet users in India, 2024

Digital Competency and ICT Skills in India

ICT skills refer to specific, teachable abilities such as searching, using software, coding whereas digital competency is broader capability that involves the confident, critical and responsible use of and engagement with, digital technologies for learning, at work, and for participation in society. Digital competency is defined as a combination of knowledge, skills and attitudes. That is why, here the study assesses the ICT skills and digital competency among people of India with various indicators such as age, education, caste, income and state wise.

ICT Skills in India

National Sample Survey Organisation (NSSO) identify the nine ICT tasks, mentioned in Table 5, from basic level to advance level and asked respondents whether they were capable to perform ICT tasks or not. Data demonstrate that most of the Indians had ability to perform simple and basic ICT tasks i.e. copy and move file or folder (24.6%), use copy and paste tools (23.3%) and send email with attachments (15.6%). On the other hand, difficult and advance level tasks were performed by very few people such as use basic arithmetic formula in a spreadsheet (5.9%) connect & install new devices (7.5%), create electronic presentation (5.1%) and write a computer program using a specialized programming language (1.5%). Overall, India shows moderate proficiency at the basic level because of daily usage of these ICT skills, but its performance declines sharply at the advanced level involving high tech applications a software. A similar pattern of declining performance from basic to advanced tasks is observed across all the states.

State-wise analysis further reveals significant regional disparities in ICT proficiency. Kerala is consistently leading among all mentioned states. ICT skills almost double from the national level. Tamil Nadu and Karnataka perform relatively better. Punjab and Gujarat recorded moderate performance while performing these ICT tasks whereas Rajasthan reveals least performer even below the national average. These variations underscore the uneven diffusion of digital skills across states, influenced by differences in educational infrastructure and digital exposure.

Table 5: State wise percentages of persons (15 years & above) who have ICT skills in India, 2020-21

ICT Tasks	Karnataka	Maharashtra	Telangana	Gujarat	Haryana	Kerala	Tamil Nadu	Andhra Pradesh	Punjab	Rajasthan	India
Copy and move file or folder	37.1	32.1	29.6	31.5	32.0	44.1	38.0	22.0	32.5	19.3	24.6
Use copy & paste tools to duplicate or move information within document	34.5	30.8	27.6	29.7	30.6	43.1	37.1	20.5	27.1	18.1	23.3
Send e mails with attached files	24.1	21.5	24.2	17.8	17.7	34.0	27.6	17.0	14.2	13.5	15.6
Use basic arithmetic formula in a spreadsheet	8.6	9.9	8.3	6.4	5.1	22.4	10.6	5.5	6.0	4.6	5.9
Connect & install new devices	12.2	11.8	9.8	8.5	6.2	21.8	18.3	6.7	5.1	5.1	7.5
Find, download, install & configure software	17.9	18.0	12.9	12.5	13.5	27.8	24.4	8.5	14.0	8.3	12.5
Create electronic presentation	12.1	7.9	7.4	5.4	2.6	16.7	13.2	4.6	3.3	2.6	5.1
Transfer files between a computer and other devices	14.1	18.1	14.4	12.5	14.3	26.8	23.9	9.7	13.6	8.1	11.5
Write a computer program using a specialized programming language	3.4	2.5	2.9	1.3	0.8	3.9	3.0	1.7	0.9	1.0	1.4

Source: Multiple Indicator Survey in India, NSS 78th round, 2020-21

Note: All figures are in percentages

ICT Skills across Caste and Income

Social and economic status determines by one's income and possession of digital tools or other materialistic things etc. Higher possession of digital tools, higher the ability to use these tools increased the proficiency. Hence the Table 6 divulges that performance of all caste groups are varied across different income groups. Income groups divided into four quartiles (Q), Q1 indicates lowest income group, Q2 and Q3 reveal moderate income group and Q4 represent higher income group. Data reveal that people from highest income group (Q4) possess highest ICT skills than other income groups, both within and between caste groups. Scheduled Tribes from all income groups remains disadvantaged across all income group especially Q1 and Q2 income group.

Despite this overall trend, Scheduled Tribes (STs) remain the most disadvantaged across all income quartiles, particularly in the lower-income groups (Q1 and Q2). Even within the highest income quartile (Q4), STs demonstrate substantially lower proficiency in basic ICT tasks compared to the General category. For example, only 29.5 per cent of STs in Q4 report the ability to copy and move files, compared to 48.1 percent among the General category. Similar gaps are observed in the use of copy-paste tools (28.0% among STs and 46.7% among the General category) and in sending emails with attachments (18.7% of STs and 36.3% of General category). These persistent disparities highlight that income alone does not eliminate digital skill inequalities. The findings suggest that entrenched structural disadvantages continue to influence ICT skill acquisition, thereby limiting the digital gains of marginalized caste groups even in higher income brackets. Thus, it can be said that income has positive and great influence on ICT proficiency and usage of digital devices similar to the findings of Zickhur 2011 and Thapar and Kaur 2022^[21].

ICT Skills across Caste and Education

Education plays crucial role in determining one's knowledge level and competency. Hargittai and Hinnant 2008^[19] stated that persons with school level education are less

knowledgeable than those of with college level education. So, educated up to school level have less proficiency to handle the technology, same kind of findings are observed in the Table 7. It presents caste wise percentages of person with ICT skills by educational level. The data clearly demonstrate the strong association between education and the acquisition of ICT skills. It was observed that persons with school level education comprises lower percentages of having ICT proficiency as compared to graduated person across all caste groups. Graduates consistently record nearly double the proportion of ICT skills in each caste category for all nine ICT tasks. For instance, the ability to copy and move files or folders, a basic ICT task, was reported by only 26.5 per cent of school-educated Scheduled Tribes (STs), 28.9 per cent of Scheduled Castes (SCs), 32.7 per cent of Other Backward Classes (OBCs) and 35.3 per cent of the General category. On the contrary, the corresponding proportions rise sharply to 72.3 per cent, 72.2 per cent, 77.1 per cent, and 76.3 per cent, respectively among graduate persons.

Furthermore, the performance of advanced ICT tasks, such as computer programming, is reported by a negligible proportion of persons with school-level education across all caste groups. Although the percentage of graduates performing such complex tasks remains relatively low, it is nonetheless significantly higher than that of their school educated counterparts. Overall, the findings indicate that higher levels of education play a crucial role in enhancing digital literacy and ICT competence in India. These findings are in the line of Kaur 2019^[20] and explained the strong relation between caste status and education. Kaur and Thapar 2019^[22] found significant relationship between usage of internet and mobile media with education indicating that individual with higher education tend to use mobile phone and internet. Education evidently increases the proficiency level among all caste groups. Strengthening access to higher education is therefore essential for reducing digital inequalities and advancing national development goals, including the vision of *Viksit Bharat*.

Table 6: Percentage of persons (15 years & above) who have ICT skills in India by caste and income, 2020-21

ICT tasks	STs				SCs				OBC				General			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Copy and move file or folder	9.3	13.8	18.0	29.5	10.2	16.4	22.4	32.2	13.6	20.4	27.3	38.1	17.5	24.2	32.0	48.1
Use copy & paste tools to duplicate or move information within document	8.1	12.5	16.6	28.0	9.2	15.2	21.0	30.3	12.3	19.0	25.9	36.7	16.1	22.6	30.4	46.7
Send e mails with attached files	3.8	6.6	9.3	18.7	4.5	8.6	12.1	20.3	7.3	12.0	17.5	27.0	9.3	14.2	20.4	36.3
Use basic arithmetic formula in a spreadsheet	0.9	1.4	2.5	6.5	1.2	2.3	3.7	7.6	2.1	3.3	6.2	11.6	3.1	4.9	8.0	17.6
Connect & install new devices	1.0	2.3	3.8	9.3	1.6	3.5	5.4	9.7	3.0	5.0	8.4	15.2	3.8	6.4	9.6	19.4
Find, download, install & configure software	3.7	6.1	8.1	15.2	4.3	7.5	10.9	15.5	5.7	9.4	13.7	21.9	7.4	11.8	16.1	27.4
Create electronic presentation	0.6	1.2	2.1	5.2	1.1	2.4	3.3	6.3	2.0	3.2	5.7	10.4	2.8	4.3	6.5	13.8
Transfer files between a computer & other device	2.3	4.0	6.4	13.8	3.3	6.3	9.4	14.8	4.8	8.3	12.5	21.3	6.1	10.1	14.9	28.4
Write a computer program using a specialized programming language	0.2	0.4	0.8	1.6	0.2	0.5	0.7	1.4	0.5	0.8	1.5	3.0	0.5	1.0	1.9	4.4

Source: Multiple Indicator Survey in India, NSS 78th round, 2020-21

Note: All figures in percentages

Table 7: Percentage of persons (15 years & above) who have ICT skills in India by education and caste, 2020-21

ICT Tasks	STs		SCs		OBCs		General	
	P to HS	G	P to HS	G	P to HS	G	P to HS	G
Copy and move file or folder	26.5	72.3	28.9	72.1	32.7	77.1	35.3	76.3
Use copy & paste tools to duplicate or move information within document	24.0	70.2	26.5	70.9	30.5	76.0	33.1	75.2
Send e mails with attached files	12.9	57.8	14.5	59.6	18.8	66.8	20.6	65.3
Use basic arithmetic formula in a spreadsheet	3.0	20.0	3.8	23.7	5.1	31.5	7.0	33.3
Connect & install new devices	4.6	26.3	5.6	28.8	7.7	38.8	8.8	35.8
Find, download, install & configure software	12.1	39.5	13.5	39.2	15.5	47.0	17.2	45.6
Create electronic presentation	2.5	15.7	3.7	19.7	4.9	28.2	6.0	26.2
Transfer files between a computer & other device	8.1	40.0	10.8	42.2	13.1	50.5	14.9	49.6
Write a computer program using a specialized programming language	0.8	5.3	0.6	5.1	0.9	9.3	1.2	9.3

Source: Multiple Indicator Survey in India, NSS 78th round, 2020-21

Note: All figures are in percentages

P= Primary, HS= Higher secondary, G= Graduation

State wise Digital Competency among Indians

The National Sample Survey Office (NSSO) in its 80th round identified seven digital tasks and asked respondents whether they were capable to perform these tasks using either a computer or a mobile device. These tasks include sending messages, using copy and paste tools, sending or receiving emails, online banking, creating electronic presentations, creating electronic documents, and reporting cybercrime (Table 8).

India comprised high percentages in performing easy and daily basis digital tasks i.e. send messages (63.6%) and use copy and paste tools (62.3%). Notably, nearly half of the population (48.9 per cent) had ability to perform online banking transactions indicating the growing integration of digital financial services into everyday life. Whereas the other digital tasks such as create electronic presentation (24.2%) and create electronic document (13.1%) contained less percentages. As the cyber world is expanding, cases of

cybercrimes are also escalating. It is disheartening to know that only 17 percent Indian can report to cybercrime. Rapid expansion of digital ecosystem and rising cases of cybercrime increased vulnerability to violation of digital rights, privacy and online safety especially among the person with low awareness and low ability of reporting cybercrime.

State-wise comparisons reveal considerable regional disparities in digital skill attainment. Haryana, Kerala, and Maharashtra emerge as leading states, recording higher percentages across most digital tasks. In contrast, Rajasthan, Andhra Pradesh, and Tamil Nadu demonstrate comparatively lower levels of digital task performance, while Punjab and Telangana exhibit only marginal proficiency. These inter-state variations highlight uneven digital capability development and underscore the need for targeted, state-specific digital skill interventions.

Table 8: State wise percentage of persons (15 years & above) who have digital competency, 2025

Digital Tasks	Ka	M	T	H	K	TN	AP	P	R	I
Send messages	68.6	70.5	62.1	74.8	70.8	58.1	57.9	69.0	56.5	63.6
Use copy and paste tools	66.5	70.3	62.0	73.4	67.1	54.7	56.6	64.4	58.8	62.3
Send or receive e-mails	57.7	53.1	47.8	57.3	49.4	47.8	42.1	44.7	38.2	43.5
Online banking	63.5	56.7	63.5	59.6	60.0	53.1	54.6	49.9	47.0	48.9
Creation of electronic presentation	30.1	25.5	28.8	36.0	22.9	24.1	25.6	27.7	21.9	24.2
Create electronic document	20.0	18.7	17.3	14.8	26.4	17.7	15.4	17.7	11.1	13.1
Report to cybercrime	25.7	23.4	27.1	21.0	24.8	21.6	15.6	19.8	22.1	17.7

Source: Comprehensive Modular Survey: Telecom 2025 (NSSO 80th rounds)

Note: All figures are in percentages

Ka= Karnataka, M=Maharashtra, T= Telangana, H= Haryana, and Tamil Nadu, AP= Andhra Pradesh, P= Punjab, R= Rajasthan and I= India

Digital Competency by Gender and Region

The data presented in Table 9 show the persistent regional and gender gap regarding ability to perform digital tasks. It is observed that urban people possessed the higher level of digital competency compared to their counterparts. Regional gap is more prominent in online banking with 20 percentage point gap followed by ability to send or receive e-mails and report to cybercrime with 19.4 and 14.9 percentage point respectively. It indicates lower levels of digital device usage and limited awareness of digital services in rural areas, thereby reinforcing the rural–urban digital divide

Gender-wise analysis further shows that males outperform females across all digital tasks, reflecting unequal access to and exposure to digital technologies among women. The gender gap is most pronounced in the use of copy and paste tools with 24.4 percentage points, followed by online banking, which shows a gap of 23.5 percentage point. A closer examination reveals that advanced digital tasks, such as the creation of electronic documents and presentations display relatively smaller regional and gender gaps. Because this narrower gap is largely attributed to low levels of proficiency among Indian population.

Table 9: Region and gender wise percentage of persons (15 years & above) who have digital competency in India, 2025

Digital tasks	Urban	Rural	Regional gap	Male	Female	Gender gap
Send messages	72.6	59.1	13.5	71.3	55.9	15.4
Use copy and paste tools	70.8	57.9	13.2	70.0	54.4	24.4
Send or receive e-mails	56.3	36.9	19.4	50.9	35.9	15.0
Online banking	62.4	42.0	20.0	60.5	37.0	23.5
Creation of electronic presentation	28.3	22.1	6.2	27.5	20.8	6.7
Create electronic document	22.7	8.3	14.4	16.0	10.0	6.0
Report to cybercrime	27.8	12.6	14.9	22.7	12.7	10.0

Source: Comprehensive Modular Survey: Telecom 2025 (NSSO 80th round)

Note: All figures are in percentages

Conclusion and Recommendations

The study found that access to mobile phones had become universal among Indian households but still inequality prevailed in ownership of smart phone and internet facility across states, regions, caste, age groups. Scheduled castes and Scheduled tribes were most disadvantaged regarding accessibility of digital tools highlighting the structural inequalities. Regarding digital competency and ICT skills, India recorded low percentages even in performing simple and basic tasks reflecting a lack of awareness, inadequate training and limited access to digital education among Indians. Further, a clear relationship had been found between ICT skills and demographic variables such as age, education, income and caste. Younger people with college level education, higher income and from general caste had better accessibility and usability of digital tools along with the better ICT skills and digital competency. Thus, demographic variables especially the 'caste and gender' determines the accessibility and usability of digital tools in India. Therefore, the present paper recommends some suggestions

- There is need to promote public-private partnerships for securing the funding, infrastructure and technology required for extensive digital literacy initiatives.
- Main priority should be given to improve the internet services, setting up the reliable broadband and public Wi-Fi hotspots in rural and remote areas.
- Courses related to digital and ICT skills should be embedded across all levels of education especially in government schools and colleges, which can help mitigate caste and income-based inequalities in the long run and also would facilitate the early acquisition of essential digital competency by future generations
- Since ICT skills rise with income across all caste groups, low-cost data plans, subsidized devices etc. for lower income households are crucial to ensure inclusive participation in digital ecosystem.
- Panchayats, NGOs, self-help groups, and local schools can act as key agents in providing the digital training and ICT skills to ensuring that digital literacy initiatives reach the most marginalized sections of society.
- Training materials should be prepared regional languages and local dialects to enhance understanding and engagement especially for the lowly educated people.

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