REIMAGINING POSSIBILITIES: REDUCING THE GENDER DIGITAL DIVIDE IN INDIA

November 2023

Acknowledgements

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Editors: Anagha Wankhede and Arshiya Gupta

Design: Usha Sondhi Kundu; *cognitive.designs@gmail.com*

CONTENTS

Abbreviations

STEM : Science, Technology, Engineering, and Mathematics

LFPR : Labour Force Participation Rate

NITI Aayog : National Institution for Transforming India

ICT : Information and Communication Technology

ITI : Industrial Training Institutes

FAT : Feminist Approach to Technology

UNICEF : United Nations Children's Funds

ORF : Observer Research Foundation

Oxfam : Oxford Committee for Famine Relief

NSS : National Service Scheme

ADB : Asian Development Bank

AI : Artificial Intelligence

MSDE : Ministry of Skill Development and Entrepreneurship

AMBER : Accelerated Mission for Better Employment and Retention

SANKALP : Skill Acquisition and Knowledge Awareness for Livelihood Promotion

YWLP : Young Women's Leadership Programme

ARCOD : Association for Rural Community Development

Executive Summary

The Fourth Industrial Revolution has been well underway reshaping the world of work. Digitalisation has been a crucial cornerstone of new-age economic and employment models. That nearly 90% of jobs today already involve a digital component underscores the ever-increasing "digital embeddedness" in the emerging work and workplace structures. As such, the prevalence of any kind of digital divide poses a challenge, both from the standpoints of productivity and inclusivity. The gender digital divide worsens, keeping almost half of the 'willing and employable population' outside the labour force. Therefore, the imperative for digital skilling of women in India is hardly an understatement. Although India's digitalisation rate surged from 10% in 2019 to 55% in 2020, only 27.5% of its youth aged 15-29 are considered "digitally skilled". In fact, **India accounts for nearly half of the global gender digital gap**. In a country that is expected to have one billion smartphone users by 2026, only 31% of women own a mobile phone compared to 60% of men. Closing this gap alone could boost global economic activity by $524 billion over the next five years.

Today, digital skills are conceived and understood in a narrow, limited sense restricted to merely building fundamental digital skills. However, the digital skill spectrum spans from fundamental skills (basic to advanced) to digital literacy to full-fledged digital citizenship, covering both practical and cognitive aspects of the digital ecosystem. A host of structural and systemic challenges impedes attaining digital skills and capabilities. While structural challenges range from gender biases to affordability issues to regional disparities, systemic challenges include government apathy, insufficient teacher training and deficient school infrastructure – limiting girls' access and participation in the digital ecosystem. The perspective highlights five hurdles that contribute to the gender digital divide: **lack of gender-responsive policies, poor access to and affordability of digital infrastructure, inadequate teacher training and low level of digital skills among youth, online safety of girls, and the lack of mindset-shifting interventions for communities**.

Government programmes such as the Rural Digital Saksharta Abhiyan, the National Digital Literacy Mission, and the recently launched Skill India Digital (SID) platform seek to bridge overall digital skill gaps with a pan-India approach to their implementation. However, these schemes lack a gender-specific focus.

This perspective explores interventions by several organisations that take a more nuanced approach to making digital literacy initiatives more gender-inclusive. **Pi Jam works towards solving the challenge of access and affordability** by providing digital devices at the school level and employing computers to create curiosity and scientific temper in young students. **Peepul, in coordination with the Madhya Pradesh government**, takes a systemic approach by creating gender-sensitive curricula and focusing on teacher training – their efforts are made scalable with technology integration. **Centre for Catalysing Change's mission is to equip and empower around 10,000 adolescent girls** from rural, tribal and vulnerable regions of Jharkhand and Chhattisgarh through their digital literacy programmes such as Akanksha

and Badhtey Kadam. On the other hand, organisations such as **Milaan serve to bridge the gap between parents and their understanding of the benefits of technology**, addressing parental fears and concerns through workshops and personal discussions.

Similarly, the **Bharat EdTech initiative**, a collaboration of 18 organisations, ensures girls' digital access by involving parents in their technology-assisted learning journey. The project enables parents to understand the importance of equipping girls with smartphones that can further improve their academic performance. The promise shown by these programmes underscores the need for further action and makes a strong case for scaling up such interventions at the national level.
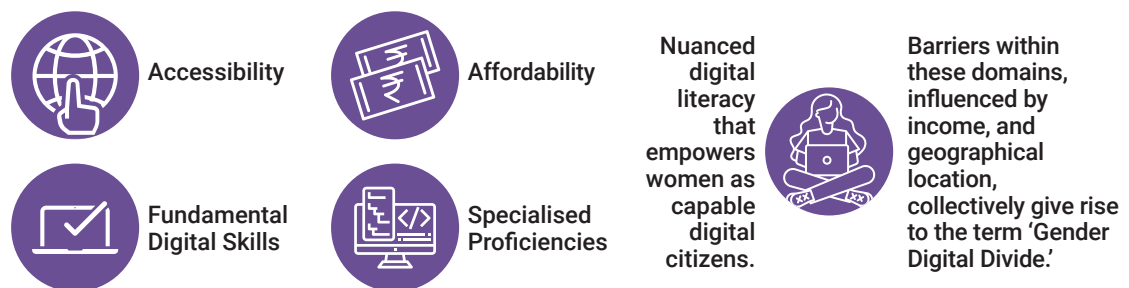
Lower Literacy Levels and Gender Norms Act as Key Contributors to the Digital Gender Divide

With the Fourth Industrial Revolution reshaping the world, digital literacy and STEM[1] (Science, Technology, Engineering, and Mathematics) skills have never been more critical. In the current work landscape, 90% of jobs[2] already involve a digital component, a trend that is only set to intensify. India ranks second fastest among the G20 nations[3] in adopting digital technologies. This shift, driven by government initiatives like PMGDISHA[4] and technology adoption, has reshaped India's employment landscape. India's digitalisation jumped from 10% in 2019 to around 55% in 2020[5], driven by governmental and technological advancements. However, the gender digital gap remains glaring, affecting young girls and hindering their economic and social empowerment. Amidst the increasing digitalisation of the nation, an issue of a digital skill gap in remote and rural India, emerges, perpetuated by inequalities related to physical access to ICT, low literacy, low economic status and inadequate social and health awareness[6]. The public education system that was already in crisis due to equity issues stemming from poor quality teaching in Government schools is facing another challenge of deepening inequity due to the increasing digital divide within the schools of India.

Figure 1: Gender Digital Divide

The gap or inequalities present between women and men regarding their access to and use of ICTs

This divide spans the entire spectrum of the digital ecosystem, encompassing factors such as

Accessibility

Affordability

Fundamental Digital Skills

Specialised Proficiencies

Nuanced digital literacy that empowers women as capable digital citizens.

Barriers within these domains, influenced by income, and geographical location, collectively give rise to the term 'Gender Digital Divide.'

This digital inequity is symptomatic of a broader challenge, encapsulated best by the term, **'The Great Digital Divide'**, which manifests across the spectrum, from accessing digital infrastructure to digital citizenship. As defined by the OECD, the digital divide refers to "the gap between individuals, households, businesses and geographic areas at different socio-economic levels concerning both their opportunities to access information and communication technologies (ICTs) and to their use of the internet for a wide variety of activities". This divide widens when superimposed with regional and gender disparities. Rural areas face digital access and affordability challenges more than urban regions. Similarly, women are more disadvantaged than men on the digital spectrum, leading to a significant

gender digital divide – leading to the glaring gender disparity in digital skills. For every 100 young men proficient in digital skills, 65 women possess similar capabilities.[7] Oxfam's report[8] reveals that the gender digital divide stems from entrenched gender role beliefs, favouring men in technology use and assigning women to domestic and caregiving duties. This results in young girls and women facing restricted access to technology (only 31% of women own mobile phones versus 60% of men), lacking ownership mindsets and essential skills. Deep-rooted biases and restrictions in our societies mirrored in education systems[9], hinder women and girls from fully benefiting from the opportunities presented by digital transformation.

Lower literacy levels of women in India, as compared to men, act as the first barrier to access. But even when adolescent girls can access the digital ecosystem, their engagement times remain abysmally low, with more than 83% of girls getting less than an hour of computer time per week[10]. This hinders their ability to build digital skills and affects their confidence to interact with the digital ecosystem and benefit from available opportunities. Consequently, they become trapped in low-paying jobs with extended working hours, perpetuating a cycle of exclusion and skill deficiency.

Literacy Rate
(Essential to build digital literacy)
65% 82%

37% of 16-24 year-olds had daily access to smartphone. 41% girls in this age group had daily access of only an hour each

41%

Accessibility

Affordability

60%
32%
Smartphone ownership for mobile internet access

26% 42%
Internet Users

3% 0.2%
Low Income Households   Middle Income Households
Expense per GB of data as a percentage of their monthly income
In India, the average cost of data stands at ₹53 per gigabyte (GB)

With India accounting for nearly half of the global gender digital gap[11], the consequences of inaction are substantial. India's adolescent girl population, constituting a quarter of the total population, demands a rapid and comprehensive response.

While the cost of women's exclusion from the digital ecosystem remains high, inclusion efforts yield significant advantages[12]. Closing the digital gender gap could stimulate a $524 billion worth of economic activity[13] increase over the next five years. Addressing this divide is vital for the economy, enhancing young girls' financial well-being, preparing them for future work, and securing their social well-being in the digital age. **For India, which aspires to become a trillion-dollar digital economy[14], bridging the digital skill gap is imperative; the failure to do so could otherwise cost $11.5 trillion[15].**

By 2030, India will have 1.04 billion[16] working-age people, marking its lowest dependency ratio at 31.2%. By contributing nearly 24.3% to the global workforce growth by 2032, India has the potential to lead[17]. Still, it depends on unlocking the digital skills potential of India's youth, including the girls. The pervasive digital divide threatens to compound India's skewed female labour force participation rate (FLFPR) – which stood at 32.8% in 2021-22, of which 91.6% are in informal employment[18]. The World Economic Forum also highlighted that digital automation will displace 57% of the jobs dominated by women by 2026[19], thus putting women at a twin disadvantage – being unprepared for the changing workforce and at a high risk of job loss due to the rise of automation – exacerbating India's already low female LFPR. Against this backdrop, enabling women and young girls' inclusion in the digital ecosystem is necessary.

Understanding Digital Literacy in the Indian Context

The digital era is not solely about mastering technology but also about understanding digital literacy[20] and digital citizenship. India's Ministry of Electronics and Information Technology[21] defines it as the meaningful use of digital tools in real-life scenarios. To understand the digital literacy levels of the students of India, it is essential to measure their competency levels to engage with the digital ecosystem. The European DigComp Framework serves as a global reference and resonates with the Ministry of Electronics and Information Technology definition. The Digicomp framework[22] divides digital skills into five categories to understand the competency level of individuals. Digital skills encompass a spectrum, from fundamental to cognitive skills, that enable individuals to engage with the ecosystem. The capability to navigate a vast amount of information defines the level of digital proficiency.

This perspective employs the Digicomp framework for user proficiency assessment to develop a digital spectrum for women in India. Before acquiring basic digital skills, girls encounter challenges in accessing digital resources, ranging from the affordability of devices to the requisite literacy skills for effective interaction. Examining the digital spectrum reveals various factors impeding girls' acquiring fundamental digital skills. The following section delves into the positioning of adolescent girls and women within the digital spectrum.

In India, even before assessing the fundamental digital skills, there is an accessibility and affordability lever that defines women's ability to participate in the digital skill ecosystem.

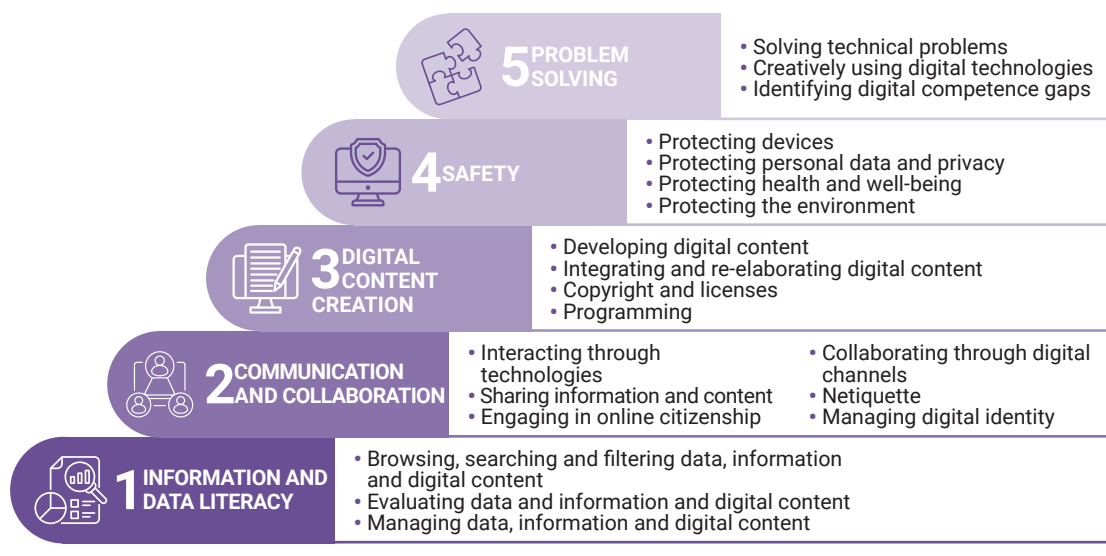## Figure 2: Digicomp Framework – Understanding Digital Competencies[21]

5 PROBLEM SOLVING
- Solving technical problems
- Creatively using digital technologies
- Identifying digital competence gaps

4 SAFETY
- Protecting devices
- Protecting personal data and privacy
- Protecting health and well-being
- Protecting the environment

3 DIGITAL CONTENT CREATION
- Developing digital content
- Integrating and re-elaborating digital content
- Copyright and licenses
- Programming

2 COMMUNICATION AND COLLABORATION
- Interacting through technologies
- Sharing information and content
- Engaging in online citizenship
- Collaborating through digital channels
- Netiquette
- Managing digital identity

1 INFORMATION AND DATA LITERACY
- Browsing, searching and filtering data, information and digital content
- Evaluating data and information and digital content
- Managing data, information and digital content

Figure 3: Digital Spectrum

4. Digital Citizenship Levers, i.e. Ethical and Responsible Tech Use

3. Specialised Skilling Levers (Domain Expertise)

Significant gender gap in advanced tech skills, with <30% women in lead positions.

2. Fundamental Skilling Levers

Basic Digital Skills   Intermediate Digital Skills   Advanced Digital Skills

Adolescent girls' digital challenges (access, affordability) lead to skill gaps.

1. Participation Levers

Access to Digital Ecosystem   Affordability of Digital Ecosystem

Adolescent girls face dual digital exclusion. 32% of Indian women own smartphones, only 26% are internet users. Exclusion at home hinders girls; schools worsen it. 83% get under an hour of computer access in a week.

Figure 4: Fundamental Digital Skills

BASIC
- Foundational and Everyday
- Using a keyboard
- Operating touch-screen
- Sending an email
- Filling an online application

INTERMEDIATE
- Comfortable and Trainable
- Navigate and use productivity tools
- Spreadsheet
- MS Office

ADVANCED
- Experienced and Professional
- High digital efficiency and competence
- Cognitive ability to adapt to new and evolving technologies
- Cloud computing
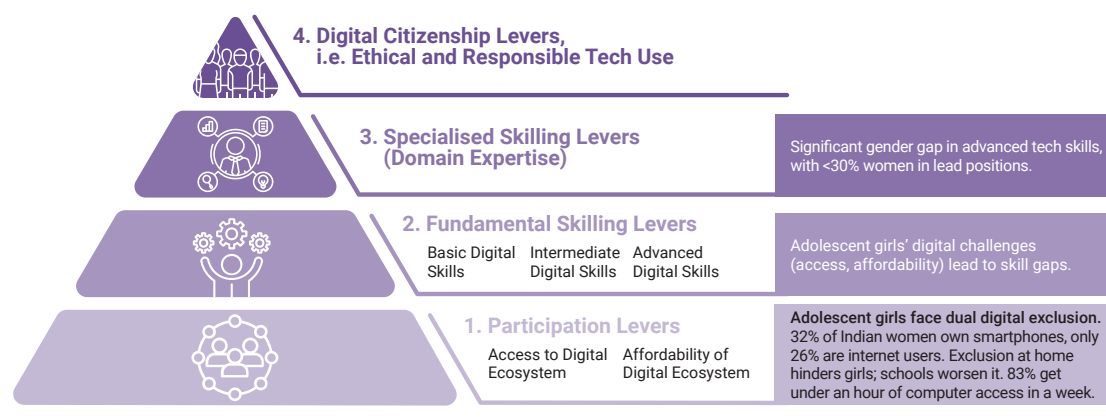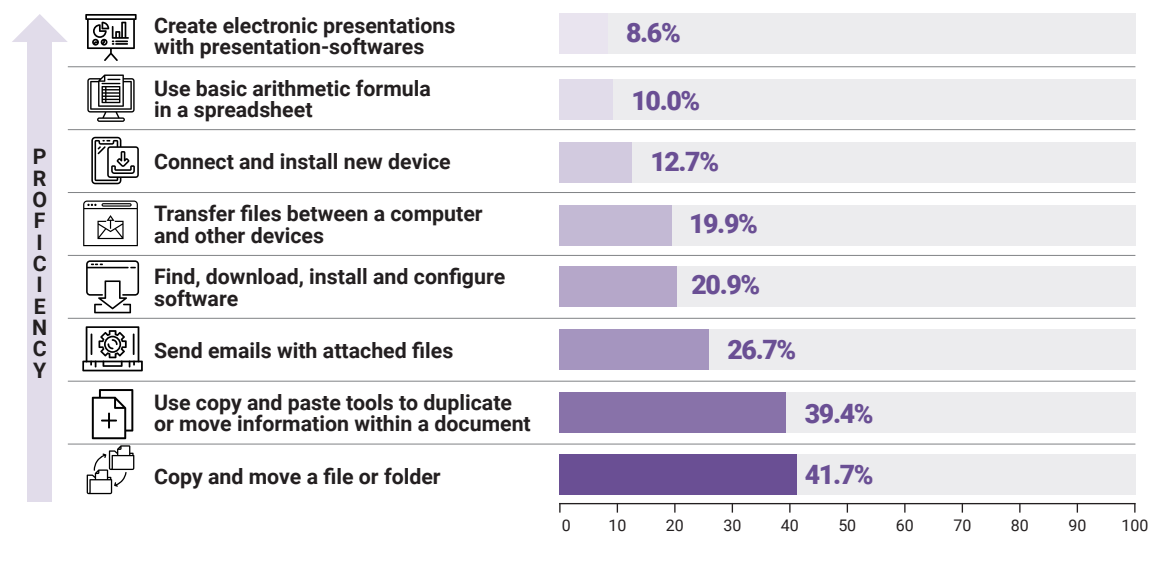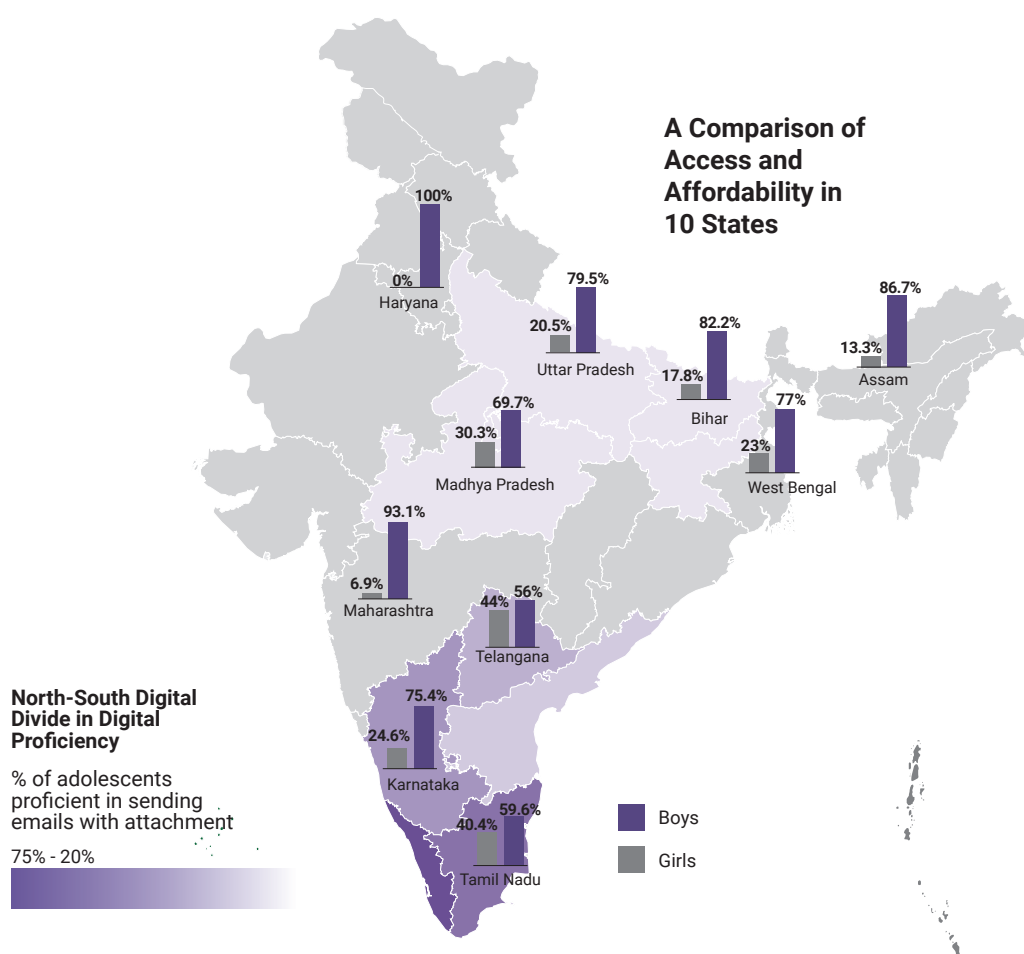- Automation

As mentioned earlier, with only 26% of women having internet access, a massive percentage of them get sorted out due to their ability to interact with the digital ecosystem. Of the remaining that can access the digital ecosystem, their competency is not built due to limited internet access and low literacy levels. There is a growing consensus that fundamental digital skills are as critical to learning and development as foundational literacy and numeracy[23]. Past research studies have divided Fundamental digital skills into basic, intermediate, and advanced skills, which are linear[24]. Analysing the digital skills of 15-29-year-olds in India reveals a discrepancy between presumed and actual proficiency. According to a study by the Institute of Governance, Policies & Politics, the average Indian youth aged 18-24 spends more than five hours daily online[25]. Contrarily, the NSSO survey[26] indicates that only 27.5% of Indian youth in the same age group possess adequate digital skills. The findings underscore the necessity for enhanced fundamental computer proficiency, including tasks like sending emails with attachments and utilising basic formulas in Excel sheets.

Figure 5: Fundamental Computer Proficiency: A look at Indians aged 15-29

PROFICIENCY		
Create electronic presentations with presentation-softwares	8.6%
Use basic arithmetic formula in a spreadsheet	10.0%
Connect and install new device	12.7%
Transfer files between a computer and other devices	19.9%
Find, download, install and configure software	20.9%
Send emails with attached files	26.7%
Use copy and paste tools to duplicate or move information within a document	39.4%
Copy and move a file or folder	41.7%

At the same time, there are notable **geographic** disparities, such as the rural-urban and North-South divide in digital proficiency. The rural-urban gap is also evident as urban regions host the majority of ICT-literate youth.

In addition to facing geographical challenges, ICT career choices exhibit a distinct gender disparity, as a mere 0.5% of girls express interest in pursuing ICT professions, in contrast to 5% of boys[27]. Twice as many boys as girls expect to become engineers, scientists or architects. This imbalance is influenced by gender biases[28], affordability issues in urban areas where STEM education costs 139% more than humanities[29], and the insufficient availability of science education in high secondary schools, compounded by a lack of gender-sensitive teaching methods and required technological infrastructure[30].

Figure 6: The Digital Divide for Adolescent Girls (15-29) in India

A Comparison of Access and Affordability in 10 States

100% 0% Haryana

79.5% 20.5% Uttar Pradesh

82.2% 17.8% Bihar

86.7% 13.3% Assam

69.7% 30.3% Madhya Pradesh

77% 23% West Bengal

93.1% 6.9% Maharashtra

44% 56% Telangana

75.4% 24.6% Karnataka

59.6% 40.4% Tamil Nadu

North-South Digital Divide in Digital Proficiency

% of adolescents proficient in sending emails with attachment

75% - 20%

Boys

Girls

Specialised Skills

As per the framework specialised skills and digital citizenship are transversal and represent the cognitive aspect of the digital spectrum. Due to low interest in technology and poor uptake of technology-related education, only 30% of women participate in specialised technology-related roles, contributing to a pronounced gender gap[31]. Given India's technological prominence, diversifying skills to match new-age industry requirements is imperative—skills like cloud architecture and AI promise to uplift the GDP by ₹10.9 trillion[32]. Thus, empowering women in these domains is not just about fairness – it is essential for development.

Digital Citizenship: Capabilities for Engaging with the Digital Landscape

Indian women lag far behind in active digital citizenship. India boasts of 759 million[33] active internet users, but this also comes with perils like scams, cyberbullying, and misinformation. As per the National Crime Records Bureau[34], cyber crimes against women, especially explicit content-related offences, skyrocketed by 110% from 2018 to 2021. As more youths come online, emphasising concepts like digital etiquette, digital health, and digital security and privacy become crucial and should be integrated into school curriculums.

Overcoming deep-seated gender stereotypes, addressing systemic issues, and **prioritising schools in solution design** are key steps to ensure India's adolescent girls thrive in the digital age, preparing them for the future of work and improving their social well-being.

Challenges Hindering Digital Competency of Girls

A study conducted by the MacMillan Centre[35] highlights the role of social norms as barriers to women's economic participation. However, the study demonstrates how incorporating gender-intentional design into social protection programmes can empower women and spark positive social change. These strategies provide a potential framework for policymakers to consider when expanding digital services and aiming to facilitate meaningful female participation in the digital economy.

The absence of strategies[36] **rooted in gender inclusivity and data-driven insights** constitutes the first barrier to advancing gender-sensitive digital education. Coupled with entrenched gender biases and systemic failure to effectively address online harassment, parents are curbing their access further, thus culminating in girls' exclusion from technology access. The gender digital divide framework below highlights the core issues leading to the gender digital divide in India.

| Poor Implementation of Gender Responsive Policies | Poor Access, Affordability and Skills to Engage With Digital Infrastructure | Absence of Gender Sensitive Curriculum and Pedagogies | Challenges of Online Safety | Lack of Community Engagement |
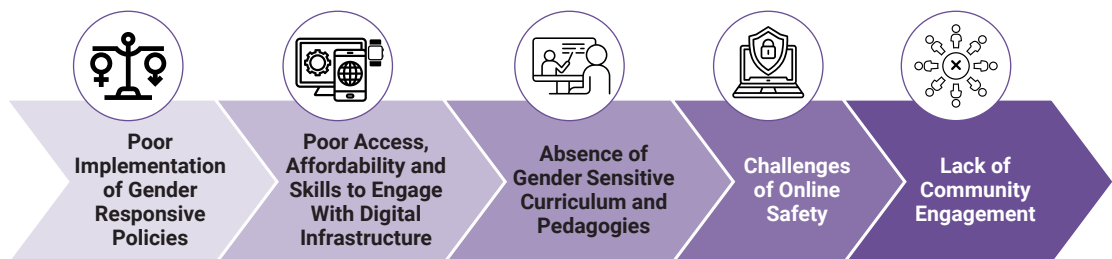
Inadequate Gender-responsive School-level Policies for School-Level Interventions

Inadequate gender-responsive policies hinder efforts to bridge the gender digital divide among young girls. Only 50% of national overarching ICT policies address gender across the globe. Moreover, over 40% of countries have no substantial policies or programmes to enhance women's internet access and safety[37]. In India, the government took a significant step in 2005-06 by introducing the two-part Gender Budget Statement in the Union Budget to integrate Gender-Responsive Budgeting. Part One allocates 100% of funds to women-specific schemes, while Part two focuses on pro-women schemes with a minimum 30% allocation for women.

The National Education Policy (NEP 2020) envisioned establishing an autonomous body – the National Educational Technology Forum (NETF)[38] to provide a platform to standardise the content and pedagogy and promote adopting new technology for digital learning.

NETF, with its deep focus on equity and access, can play a crucial role in enabling schools to adopt technology in the near future. Although a gender-sensitive strategic approach is currently lacking, NEP offers a hopeful outlook for bridging the gender digital divide and fostering broader digital progress in India. The Information Communication Technology (ICT) Curriculum for students proposes a three-year course with three sessions per week. Schools may opt to begin the curricular programme as early as sixth grade (beginning of the upper primary stage) till the student leaves school. The Government of India recommends building teachers' capacities to become active ICT users. However, implementing ICT depends mainly on the quality of infrastructure available in schools.

Poor Access, Affordability and Digital Skills Restricts Girls' Engagement with the Digital Ecosystem

The challenge of acquiring digital skills for adolescent girls prevails at two levels – the household and the school. Apart from gender biases, the affordability of digital devices is also a bottleneck. For 57% of adolescent girls, their families' financial condition is the major deterrent in accessing laptops and mobile phones. 85% of girls do not have laptops or computers at home[39].

However, households are not the sole barrier. Schools, which should be pillars of digital learning, often fall short when addressing the digital learning divide. The numbers for key infrastructural provisions like internet access and computers are worrisome[40]. Government schools perform the lowest on fundamental infrastructural indicators such as computer and internet availability and functional electricity.

Figure 7: Computer and Internet Penetration in Schools
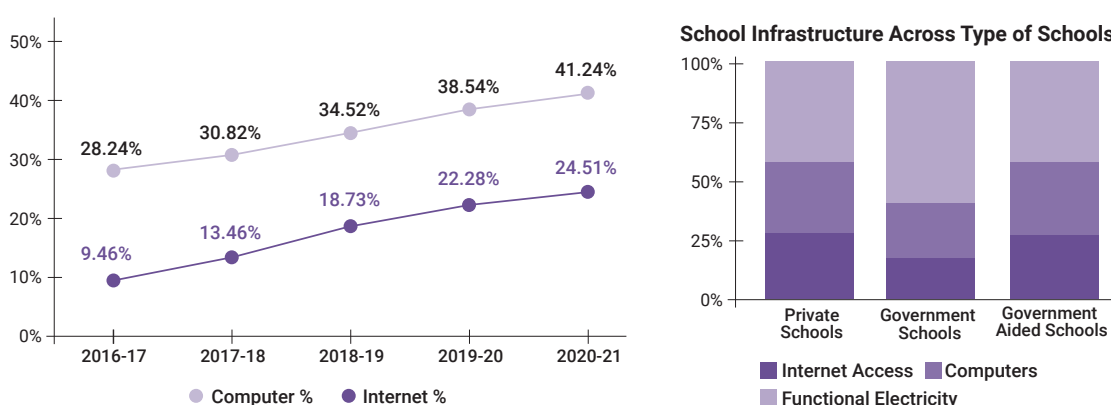
Source: IDI Sattva

"Even in urban areas, schools face challenges with internet, electricity, and inadequate computer access. Yet, there is an expectation for teachers to leverage technology for enhanced learning, despite these resource constraints."

– **Priya Iyer**, Independent Consultant, UNICEF

Even in developed states like Karnataka, the challenge of digital access is glaring, hinting at even graver situations in less developed states like Bihar and Rajasthan. Providing robust infrastructure can be a particularly effective means towards increasing regular attendance[41]. This holds particularly true for the poor attendance shown by girls in primary grades, which eventually leads to dropouts in higher grades. Innovative funding mechanisms are crucial to ensure basic digital infrastructure in primary and middle schools and build enthusiasm and regular attendance.

Absence of Gender-responsive Digital Education Leads to Attitude Challenges for Girls, With Many Facing Computer Anxiety Due to Prevalent Societal Norms

Gender-sensitive pedagogy is key to promoting a gender-responsive and integrative approach to imparting knowledge that girls need to interact with the world and effectively participate in the future workforce. The lack of gender-responsive and digitally informed pedagogy means that educators lack the skill set to enable young girls' participation in the digital world. Only 77% of women in India are literate (2023) compared to 85% of men[42]. The absence of fundamental literacy leads to a deficiency in skills and self-assurance, serving as a significant barrier[43] to accessing and utilising digital and mobile technologies. Besides, the absence of role models in the form of their teachers using ICT in their teaching methods also adds to the challenge.

Teachers' readiness to make effective use of school technology investments is notably low, as only 15% feel confident in technology utilisation, and merely a third (33%) have undergone practical training. These obstacles, coupled with time limitations and differing teaching priorities, hinder educators from fully capitalising on available resources and adequately preparing students for the future. Similar patterns are evident among educators in India. The deficiency in digital literacy and limited ICT integration among teachers compounds this divide. Teachers' beliefs[44] about their ability to deal with ICT are closely related to implementing ICT in school-related learning environments. Limited opportunities for ICT training for teachers lead to fewer opportunities for subsequent dissemination to students.

> *"In schools dealing with teacher vacancies and where timetables are frozen at the beginning of the year with the intent of curriculum completion, it is difficult to find time for the course, specifically for computer science. Hence, it is critical to work with the leadership, train subject teachers, and encourage them to use computers while teaching subjects like social studies or science. That helps build analytical and problem-solving skills in the students using computers."*
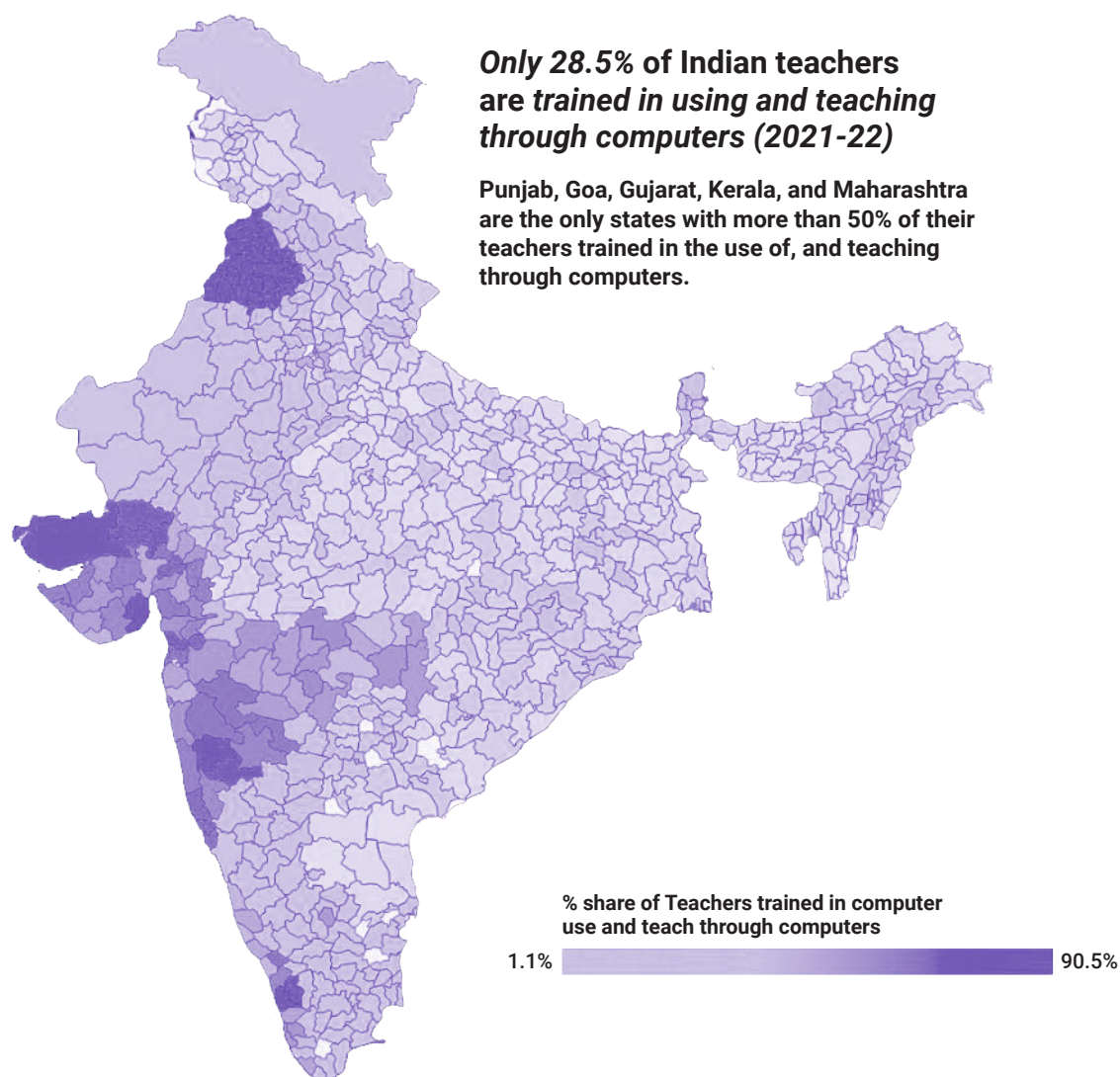>
> – **Abhay Singh Yadav**, Project Manager, Peepul

Consequently, even if young girls gain access to the digital realm, their potential for upskilling still needs to be improved due to the lack of proficiency in their primary resource: teachers. Notably, disparities in digital literacy and ICT adoption among educators persist, showing significant variations across states. For instance, the utilisation of ICT by teachers in schools

ranges from 87.67% in Punjab to 4.32% in Mizoram. Teachers' lack of tech skills or having an apprehension towards ICT[45], could hinder students' inclination towards adopting digital skills, especially females, who may already feel less confident with technology. Female teachers may inadvertently pass on these anxieties, affecting female students disproportionately. From the gender perspective, integrating digital literacy into teacher training can combat gender stereotypes in education.

Figure 8: The Digital Divide for Adolescent Girls (15-29) in India

Only 28.5% of Indian teachers are *trained in using and teaching through computers (2021-22)*

Punjab, Goa, Gujarat, Kerala, and Maharashtra are the only states with more than 50% of their teachers trained in the use of, and teaching through computers.

% share of Teachers trained in computer use and teach through computers

1.1%   90.5%

Source: IDI Sattva

Apart from teacher readiness, another challenge is the curriculum, mainly limited to word processors, spreadsheets and basic programming. There is no provision for teaching a variety of computer interactions as part of everyday life. '*This leaves little scope for experiential learning and building digital literacy in students*' states Ajay Singh Yadav, from Peepul, which works with municipality schools in Delhi, and is building digital literacy for students through a

comprehensive curriculum for students and teachers. Apart from school, the other institutions that can contribute to bridging the digital gender divide are the Industrial Training Institutes (ITIs). The vocational training system in India is firmly established across the nation through a network of over 14,000 ITIs, instructing more than two million youth annually[47]. However, the participation of female students[48] remains relatively low, accounting for only around 12%. Despite implementing a 30% seat reservation policy in certain ITIs, its effectiveness is limited, and even in those designated exclusively for women, the allocated seats are not fully utilised. Adding to this challenge, nearly two-thirds of online trainers lack specialised digital skills[49] for programmes tailored for women, disadvantaged youth, indigenous communities, impoverished individuals, and remote areas with limited internet connectivity.

Online Insecurity for Women is Fuelled by Cyber-bullying, Gender Stereotypes, and Online Harassment

Most evidence suggests that lack of cybersafety for young women translates into their active exclusion from the digital ecosystem. A recent study conducted in 22 nations revealed that girls and young women encounter the most substantial levels of online harassment[50]. According to a global study, 38% of women have experienced online violence, 85% of women who are online have witnessed it against other women, and online harassment for most girls starts between the ages of 14-16 years[51].

Adverse encounters in the form of cyberbullying, gender-based stereotypes, and online harassment that numerous girls and women have in online spaces can result in harmful outcomes. Many families discourage girls from such engagement. These detrimental online experiences, along with those in media and social networks, can affect the well-being of young girls and women, negatively impacting their self-esteem, trust, and, ultimately, their mental health and physical safety[52].

The lockdowns resulting from the pandemic worsened this issue globally, intensifying the online abuse directed towards women[53]. The situation harmed those seeking to shift to digital platforms to restore their careers or voice their opinions as part of the global online community. Recognising that online violence can hinder women's digital skill development, the G20 Digital Economy Ministerial Declaration of 2017[54] in Hamburg acknowledged the necessity of prevention, protection, and raising awareness about the experiences of women and girls in the cyber world. 80% of children in 25 countries[55] report feeling in danger of sexual abuse or exploitation online, and adolescent girls are at added risk of vulnerabilities. Therefore, cybersafety and cybersecurity must become essential elements of the digital skilling journey. There is a pressing need to focus on digital literacy and citizenship to enable young girls' online presence.

Community Perceptions Towards Technology Define Young Girls' Experience of the Digital World

The interface between community and technology plays a critical role in shaping young girls' relationship with technology. Community levers operate at two levels: within

the home and influences external to the home, the latter shaped by the larger social environment of young girls. For instance, parents' digital literacy informs access and participation in the digital ecosystem for children. Mothers' lack of digital literacy and skills translates into negative experiences around access and usage for young girls[56]. With children being deemed digital natives[57] and parents being deemed digital immigrants[58], a complex relationship exists between parents and children concerning technology usage. When prevalent gender norms and biases are laid over this superstructure, access and participation become more difficult for young girls.

> *"We need to recognise that parents are extremely critical to any change. Partly because there is a discord between their aspirations for their child, as against a child's aspiration, and partly in response to their own experiences. Add to this the status-quo nature of patriarchal roles, which further restricts available choices for women."*
>
> – **Prerna Kumar**, Convergent Views

In addition to parents exerting a strong influence on shaping digital interactions at home, communities also wield considerable power. The internet is commonly seen as a disruptor of traditional social norms and deemed unsafe for women and girls. Male gatekeepers (or family/community members) frequently control or limit women's and girls' access to devices and the internet. For instance, certain rural communities in Northern India have entirely forbidden women from using mobile phones, while other communities have issued decrees labelling internet use as "immoral" for women[59].

> *"Although girls can access smartphones, their access is completely scrutinised by male family members, as they own the smartphone."*
>
> – **Rati Misra**, Milaan

Multiple studies reveal that these limitations are more pronounced among younger women and girls. The absence of role models for girls, or even family members who believe in the power of digital education within the surroundings, aggravates challenges for girls in accessing technology.

> *"As adolescence is a sensitive age, parents fear that smartphones will hamper their [girls'] social behaviour; besides they do not see any economic benefits associated with educating girls after the tenth or providing them with digital literacy."*
>
> – **Javed Abbas**, Milaan

As parents and the broader community play an essential role in shaping young girls' digital experiences, it becomes integral to expand the interventions to build their awareness, and focus on efforts on social re-engineering to provide more opportunities for young girls.

From Divide to Digital Drive: Expanding Women's Socio-economic Opportunities

Reducing The Great Digital Divide: Successful Scalable Solutions

Numerous initiatives are being pursued to bridge the gender digital divide in India. These efforts encompass improving access and affordability of digital devices, crafting gender-sensitive curricula, training teachers in ICT skills, and fostering community attitudes that encourage girls to embrace digital skills. These approaches are vital for creating a more inclusive and equitable digital landscape.

This section explores interventions addressing the critical challenges discussed above, The broad interventions selected addressing the existing challenges and have an element of scalability as summarised in the table below:

Name of the programme	Intervention Implementers	Mode of Execution	Focus of the Intervention					
Pi Jam	Pi Jam Foundation	Provides access to computers and instructors in schools	Access	Affordability	Fundamental Digital Skills	Specialised Digital Skills		
Project Akanksha	Digital Empowerment Foundation (DEF) and C3	In-person training of adolescent girls at anganwadi and community centres	Access		Fundamental Digital Skills	Specialised Digital Skills		Digital Citizenship
Young Women's Leadership Programme	Feminist Approach to Technology (FAT)	Trained staff imparts contextualised curriculum to the students	Access		Fundamental Digital Skills	Specialised Digital Skills		
Bharat EdTech Initiative	Multi-stakeholder Collaborative	Bridges the learning gap for students from low-income communities using technology	Access				Digital Literacy	
CM Rise	Peepul, in collaboration with Amazon Future Engineer (AFE)	Onboards teachers who impart digital skills in Delhi schools	Access	Affordability	Fundamental Digital Skills	Specialised Digital Skills	Digital Literacy	
Girl Icon Programme	Milaan Foundation	Online 12-month course for girls and workshops for fathers and brothers	Access					Digital Citizenship

Access Affordability Fundamental Digital Skills Specialised Digital Skills Digital Literacy Digital Citizenship

1. Developing gender-responsive policies and plans

The Indian government has launched various initiatives to improve youth digital skills. A recent addition is Skill India Digital[60], a comprehensive digital public infrastructure (DPI) introduced in September 2023 to consolidate government efforts on a single platform for education, skill development, employment, and entrepreneurship. Some notable programmes are the Pradhan

Mantri Gramin Digital Saksharta Abhiyan[61], certifying over 40 million candidates in digital skills, and the National Digital Literacy Mission, training 11 million candidates as of October 31, 2022.

However, these programmes have not exclusively targeted women. The government is hence implementing schemes focussed on empowering women through digital skilling, as highlighted in the G20 declaration 2023[62], which emphasised the creation of a Tech Equity Platform to enhance digital and financial literacy for women.

The AMBER scheme, co-funded by the Ministry of Skill Development and Entrepreneurship (MSDE) and private philanthropy under the SANKALP programme, aims to train 30,000 youths, with half of the beneficiaries being women[63]. However, targeted government interventions that ensure advanced digital skills for schoolgirls are still a far-fetched dream. This remains a white space and calls for data and evidence generation to propel advocacy for such initiatives.

2. Ensuring access and connectivity to digital technologies for girls

India grapples with stark digital infrastructural disparities, especially in rural areas, which are exacerbated for marginalised communities, including considerations of caste and gender. Civil society and the industry have launched initiatives to address access and affordability issues, focusing on empowering girls.

a. Targeting access barriers in digital skilling

Several interventions are targeted towards resolving challenges to access. Project Nanhi Kali by the Mahindra Foundation and Pi Jam Foundation's efforts are worth mentioning.

Pi Jam was founded in 2017 when Shoaib Dar, a mechanical engineer and Teach For India Fellow, encountered a group of thirty students, of whom only seven students, including just one girl, had come across computers. It aims to provide affordable and high-quality computer science education to students and educators across under-resourced schools through a systems approach by working across all levels of the education ecosystem through its interventions.

PJam	5,000 Teachers	4,86,000 Students	51 Schools	Geography - 3 States Telangana, Maharashtra, and Jammu & Kashmir

Pi Jam offers contextually curated curriculum and best practices, co-creating programmes with various system partners such as NITI Aayog, Samagra Shiksha, Ministry of Education, and UNICEF to ensure the education is relatable. The solutions encompass:

- Modular pedagogy, low-cost experiential 'Pi labs'
- Teacher training programmes,
- Mobile-based tool 'Code Mitra'
- Building focus on skills like coding, problem-solving, and creative thinking through a scientific approach.
- Conducting experiential workshops designed to challenge students' critical thinking and problem-solving abilities, well-equipped Pi Labs featuring grade-specific curricula, teacher training, and mentorship.

Pi Jam encourages a problem-solving approach among students, introducing them to computational thinking, algorithm forming, and machine learning through various computing modes. It focuses on enabling students with critical proficiencies to navigate the digital era effectively. It resonates with children from different grades and helps them strengthen their understanding of subject areas through practical technology experimentation..

"Being in the development sector has deepened my understanding of community needs, fueling my passion for impactful change. We employ a holistic and contextualised approach to nurture foundational skills such as problem-solving, design thinking, and computational thinking, aiming to make digital education relatable and equitable."

– **Shoaib Dar**, Pi Jam

Project Akanksha: Improving digital access for girls in rural areas
The Digital Empowerment Foundation (DEF) and C3 have crafted Project Akanksha[64] which prioritises foundational digital skills for tribal girls. Akanksha aims to equip girls in the age group of 13-19 years in Jharkhand with basic ICT literacy and life skills.

Project Akanksha, with their team of facilitators, reaches adolescent girls at Anganwadi centres (they are opening their own community centres as well). Their holistic digital skill curriculum goes beyond technical skills, and includes digital and life skill education. It empowers girls by enhancing their negotiation skills and enabling better decision-making for themselves and their families.

The project recognises the importance of internet safety. Therefore, the curriculum addresses issues related to cyberbullying and teaches girls how to navigate the digital world securely. Project Akanksha uses a multifaceted approach to deliver digital education.
- It combines theories, interactive videos, and activities to provide a comprehensive digital education experience.

- A team of facilitators, armed with laptops and pico projectors play a crucial role in delivering digital education to girls in schools and community centres via Anganwadi outreach, thus broadening access in remote regions.
- A comprehensive manual covers various aspects of digital media, including hardware, software, applications, internet usage, email, social media, and cyber security. Facilitators use this manual as a training resource.

Impacting
15,000
girls between
13-19 year age group

18%
Girls can **identify 'google.co.in'** as the address for a popular search engine – compared to 5.4% before.

33%
Girls know that they can use the **internet to check exam results.**

40%
Girls understand the **function of a keyboard** – compared to 11.5% before.

46%
Girls in the programme decide independently on **how to spend the money they earned.**

Akanksha's holistic approach has proven to be an effective model for girls in underserved tribal communities by building digital skills for their overall development and well-being.

3. Digital teaching and learning through gender-responsive curriculum and pedagogy

Schools can address systemic access issues by using gender-inclusive teaching methods and curricula.

a. Digitally empowering adolescent girls through the Young Women's Leadership Programme

A gender-responsive curriculum ensures that educational content and approaches are inclusive and cater to the diverse needs and interests of both genders. The Feminist Approach to Technology (FAT) has created one such intervention, which not only builds digital skills for girls but also enables them to be role models leading to solving societal problems.

In 2015, following continuous enhancements and the establishment of a structured gender-sensitive curriculum, the nonprofit **Feminist Approach to Technology**[65] introduced an initiative called the Young Women's Leadership Programme (YWLP). The programme's core emphasis is to foster leadership by offering adolescent girls and young women (aged 14 to 19) an educational platform that not only imparts a strong grasp of their rights but also equips them with critical 21st-century technology skills.

Operating in four states, the project integrates a gender-responsive curriculum, aiming to equip young women with 21st-century technology skills while fostering leadership and a strong understanding of their rights. YWLP is implemented across four states in India: Jharkhand, Maharashtra, Delhi, and Bihar, and operates on two levels:

Level 1: Developing digital skills and building an understanding of their rights
- At Level 1, girls aged 14 to 18 are equipped with basic computer and internet skills, effectively dispelling their fear of technology. Simultaneously, they undergo training to enhance their confidence and learn how to leverage technology for their personal development.
- The programme intends to help young women gain a deeper understanding of their rights, develop the ability to connect with others, access critical information, and acquire the skills necessary to negotiate for their rights within their families and communities.

Level 2: Leveraging tech skills for community impact
- Building on the skills acquired in Level 1, girls aged 16 to 19 progress to Level 2, where they learn to utilise their tech skills for collective action within their communities..
- The participants employ various new-media tools such as films[66], radio shows, photo stories, songs, slogans, and community actions to influence community members.
- The intervention encourages the community to consider life issues from the perspective of adolescent girls, amplifying their voices and concerns.

YWLP (FAT)

Since its inception, **over 500 women** have participated in the programme.

Geography - 3 States
Telangana, Maharashtra, and Jammu & Kashmir

At FAT, the commitment to enhancing women's engagement with technology is multifaceted, viewing them as users, creators, and decision-makers. By focusing on technology accessibility for women, enabling their participation in STEM, and advocating for their presence in tech decision-making, FAT endeavours to uplift women's agency and leadership.

From 2023 onwards, the programme will be delivered at Community Tech Centres run by Young Women Leaders, themselves graduates of FAT's programmes. This fosters an environment where female role models empower other women to excel in technology, promoting a stronger and more inclusive tech ecosystem.

Targeted interventions to impart digital literacy and enhance capacity building of teachers
A range of strategies are needed to equip teachers to create classroom environments that are participatory and gender-equitable. Among these, the most crucial is the availability of gender-responsive curriculum, pedagogy, and trainers to help teachers inculcate digital skills and literacy among girls.

Peepul, in collaboration with Amazon Future Engineer (AFE) aims at developing a holistic approach to imparting digital literacy and building teachers' computer skills to ensure the effective delivery of digital skills in an equitable manner.

4 TIERS OF SCHOOLS ENVISIONED

52 District Schools

261 Block Schools

3,200 Cluster Schools

5,678 Other Village Schools

Geography Madhya Pradesh and Delhi

A. Digital Literacy Curriculum and Teacher Training: The programme operates in Madhya Pradesh's 52 districts and focuses on capacity building for teachers to impart digital literacy to students.

- Through continuous workshops with teachers and curriculum experts, the Peepul team curated a gender-sensitive digital literacy curriculum for teacher education in coordination with the MP Government.
- It equips teachers and education officials with the skills necessary to effectively manage resource-deficient classrooms. The curriculum is supported by pedagogical techniques to enable teachers to build the digital skills of students.
- Master teachers are trained by Peepul staff and then hand-held while conducting training for other batches of teachers in the cascading training model.
- One of Peepul's key achievements has been incorporating 40 sessions for computer science education in all government schools of MP.

B. CM Rise Project[67]
- Targets underserved communities and focuses on students aged 11 to 17.
- The objective is to build analytical and critical thinking by teaching Computer Science, leveraging subjects like Social Sciences and Environmental Sciences to make comprehension easier, and eventually ensure retention of concepts taught.
- Promote digital skills, foster 21st-century competencies, encourage self-regulation, advocate online safety, and nurture an interest in digital technology.

- The project is implemented within Delhi's municipality schools, through thoroughly designed, contextualised content and practical exercises.
- A series of sessions with the school administration helps in incorporating computer science sessions within the school timetable. Simple gaming tricks are taught to teachers to inculcate digital skills while teaching their subject-specific content through computer-assisted content.

"We witness our students sharing stories of instances where their parents encountered false information, and these students were able to guide their parents, preventing them from falling into such traps. By imparting digital skills, we are also nurturing critical thinking and problem-solving abilities."

— **Shubham Singh**, Peepul

4. Targeted solutions to build awareness about safe digital learning environments

Digital literacy empowers young learners while instilling responsibility in their online interactions. Girls' safety on the internet can be achieved by interventions addressing the following aspect:

- **Digital literacy education:** Provide comprehensive digital literacy programmes that teach girls how to navigate the internet safely, identify potential risks, and protect their personal information.
- **Safe online spaces:** Encourage girls to use safe and monitored online platforms, especially if they are engaging in social media or online communities
  - » **Cyberbullying Awareness:** Raise awareness about cyberbullying and teach girls how to recognise, respond to, and report it.
  - » Responsible utilisation of social media platforms.

The **Digital Empowerment Foundation**[68], in conjunction with Ankur Welfare Association, Happy Horizons Trust, ARCOD, and Luminous, started the DiGi Lamp programme. This initiative aimed to impart vital digital literacy sessions to high school students (classes 9th-12th) in Gagret (Himachal Pradesh), Baddi (Himachal Pradesh), Roorkee (Uttarakhand), and Hosur (Tamil Nadu), with a particular emphasis on fostering responsible internet usage. The carefully crafted curriculum addresses topics such as fundamental computer skills, online safety, digital citizenship, and the responsible utilisation of social media platforms.

The sessions comprise the following aspects:
- Dynamic and interactive approaches, incorporating elements such as quizzes, games, and videos to captivate students and enhance their hands-on digital competencies.
- Laptops to bridge theory and practice.

- Additionally, students were encouraged to take on projects emphasising responsible internet use, nurturing their competence for future endeavours.

Despite initial challenges, such as students' limited digital awareness and language barriers, trainers use innovative techniques to boost engagement and foster responsible internet behaviour.

5. Working with Communities

A singular focus on imparting digital skills is inadequate to address the underlying structural barriers hindering girls' digital access. A holistic approach calls for community engagement, especially with decision-making figures holding sway over girls' digital access. Although there exist certain fragmented initiatives aimed at cultivating community awareness regarding enhancing digital proficiency among girls, there is a dearth of efforts addressing parental concerns, and accepting their fears, leading to an inclusive and equitable digital environment for adolescent girls. One such intervention that not only engages with girls but teaches them to navigate patriarchal norms is the Girl Icon programm.

Engaging communities and families in transforming mindsets with Milaan Foundation's Girl Icon programme

Milaan
Building a movement of Girl Leaders

Milaan is dedicated to changing community mindsets, removing obstacles that hinder girls' education and development. Their flagship programme, Girl Icon[69], plays a pivotal role in reshaping perspectives, particularly among men, and driving positive change.

Madhya Pradesh and Uttar Pradesh are regions of concern as they have over 10% out-of-school girls[70]. The challenges faced by girls in these regions are numerous: child marriage, adolescent health issues leading to inconsistency in attending school, less importance granted to completing education. With many girls dropping out after the 5th grade due to these challenges, one of Milaan's mission is to ensure that every girl completes her secondary education and is equipped with additional digital skills to navigate life, post-school successfully. Milaan, through its contextualised curriculum, trains girls on digital skills which builds their capability to navigate gendered restrictions and also acts as a role model for younger girls.

> *"When the younger girls see a 16-17-year-old girl smartly navigate different apps on the smartphone and communicate confidently, they aspire to be like the Girl Icon in the village."*
>
> – **Pragya Bisen**, Girl Icon Project

The organisation collaborates with school teachers, ASHA workers, and ANMs to convey positive messages within the community. This messaging, facilitated by trusted

community figures, promotes the Girl Icon programme and empowers girls to be role models. Initially, parental support was a challenge, but COVID-19 increased acceptance of digital platforms. Maintaining regular communication with parents has helped in gradually shifting their attitude.

"Clear communication with the fathers and brothers is the solution. We have one-on-one conversations with them, and conduct regular workshops to explain that support from them can transform their child's life. We understand their apprehensions and provide safe spaces to share their fears. We ensure that families can discuss their challenges and thoughts."

– **Pragya Bisen**, Girl Icon Project

To address awareness-related challenges, Milaan suggests a strategy that focuses on helping students develop reading habits and educating them on the effective utilisation of digital devices and platforms, fostering their belief in online opportunities. To ensure a more holistic approach, the foundation also conducts online safety sessions and counts digital citizenship as a key component of their efforts. Milaan collaborates with 29 grassroots organisations, working closely with district and state government departments.

MILAAN FOUNDDATION

Impacted **35,000** girls

Aim to impact **100,000 girls** by 2025

Geography Uttar Pradesh and Madhya Pradesh

The scalability of the Girl Icon programme is ensured by the integration of technology due to its affordability and broad outreach.

Besides interventions in the school and with adolescent girls, there are several initiatives that are working towards lifelong learning of women and building their digital skills in rural areas. Not only does it enable women's integration with the digital ecosystem but also contributes to reducing the rural digital divide.

One such intervention is the **Bharat EdTech Initiative**[71]. Bharat EdTech Initiative (BEI) is a multi-stakeholder collaborative that aims to bridge the learning gap for students from low-income communities using technology. In collaboration with 34 organisations, BEI is mobilising a digital learning ecosystem that can positively impact the improvement of learning outcomes for first-time digital users across India.

BEI is spread across 17 states, impacting more than two lakh students. By leveraging at-home learning time to ensure quality education, BEI believes that students can learn flexibly and independently. However, this is also leading to a shift in parental attitudes towards EdTech adoption, particularly among parents of daughters. The addition of a gender-inclusive curriculum and teaching methods allows young girls to voice their concerns confidently using technology. Tech-enabled learning processes foster inclusivity, accommodating those with household responsibilities or mobility constraints due to cultural norms.

According to Ms Pushpa Kalidas Rathore, the principal of a government school where BEI is being implemented,

> *"For the challenge of device access, I approach parents and convince them to let their children use their smartphones. While there is a long way to go, my biggest joy comes from seeing parents realise that educational technology is something they can trust!"* [72]

While the primary objective of BEI is to enhance students' academic performance through technology, it has also effectively addressed the substantial obstacle of technology access. Simultaneously, it has cultivated parents' confidence in technology as an educational tool. Parents have observed noteworthy enhancements in their children's academic achievements since the adoption of EdTech. Interventions like BEI and Milaan are directly or indirectly influencing the community to enable girl's digital journey, creating role models within the rural ecosystem for other communities to follow.

Conclusion

It is imperative to stimulate digital adoption and utilisation among adolescent girls, as their limited digital skills may constrain their employment opportunities, and hinder their integration into the workforce. Addressing the barriers to digital access and active participation in the digital age becomes a critical effort to avert the potential widening of the gender gap in the labour force.

The pressing need is for all stakeholders, including government, industry, and philanthropy, to unite and address the challenge collectively. As the nation moves towards having digital infrastructure as the core of public life, building girls' digital capabilities will help break the cycles of inequality and help in establishing equity in society.

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