



DIGITAL DIVIDE TO DIGITAL CONVERGENCE IN EDUCATION

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In recent years, the problem of the digital divide has attracted much debate and speculation given the economic, social and political consequences. It is a proven fact that the digital divide in India has created exclusion, endangers social integration and has hampered economic growth.

The term “digital divide” refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities.

The digital divide is inextricably linked to digital literacy which is defined by the Ministry of Electronics and Information Technology as “the ability of individuals and communities to understand and use digital technologies for meaningful actions within life situations.”

This report explores how India can overcome the digital divide, exacerbated by the pandemic, with easy accessibility and availability of technology to all. Systemic issues such as illiteracy, lack of skills, infrastructure, and investment in rural areas need to be addressed if India is to diminish the digital divide gap. The report highlights the opportunities provided by the National Education Policy (NEP) for technology partners to help the education sector make a leap in the interest of our future generations.

Additionally, the role of the government and technology companies is crucial to help bridge the digital divide, by enabling the population to be digitally equipped in terms of both skilling and employability and to help India reach its target of becoming a US\$1 trillion digital economy by 2025.

Digital Divide: Factors

In the two years that it has raged, Covid-19 has devastated lives and destroyed livelihoods. An even more insidious impact of the lockdowns forced by the pandemic has been on the lives of children and young adults who were forced out of schools for long periods. Estimates indicate that upwards of 250 million students were affected due to these closures leading to learning losses that can barely be quantified but could be catastrophic in the long run along with a sharp rise in dropouts, and a further rise in the digital divide. Into this breach have appeared the NEP 2020, and subsequent initiatives by the government including the National Digital Education Architecture (NDEAR) and National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN Bharat).

In India, the digital divide has further deepened because of the pandemic. India has the world's second-largest pool of Internet users, about 600 million, comprising more than 12% of all users globally. The government has also set an ambitious target of becoming a US\$ 1 trillion digital economy by 2025—a fivefold growth from the US \$200 million in 2017¹⁸. Yet half of its population lacks Internet access, and even if they can get online, only 20% of Indians know how to use digital services, according to government data. Recognising the urgency to upskill rural India and bridge the digital divide across rural and urban India, the Government of India launched the Pradhan Mantri Gramin Digital Saksharta Abhiyaan (PMGDISHA) scheme in 2017. As of 2021, approximately 2.76 crore candidates have been certified as digitally literate under this scheme.

Before the pandemic, the government estimated India's digital shift could unlock as much as US\$ 1 trillion of economic value over five years. However, the pandemic has widened the socio-economic

inequalities. A study by the Azim Premji Foundation showed that almost 60% of school children in India cannot access online learning opportunities. A similar study by Oxfam India found that even among students of urban private schools, half of the parents reported issues with Internet signal and speed. A third struggled with the cost of mobile data. Only 20% of school-age children in India had access to remote education during the pandemic, of whom only half participated in live online lessons, according to a new national sample survey by ICRIER and LIRNEAsia, a think tank focusing on digital policy. In fact, 38% of households said at least one child had dropped out of school due to the pandemic.

Supply chain disruptions due to the pandemic and geopolitical issues have also exacerbated matters with delays in shipments and the consequent inflation of the prices of goods.

In addition, government policies, such as the amendment of the General Financial Rules (2017), restrict bidders from countries with which India shares a land border from participating in tenders for government procurement without approval from competent authorities on the grounds of national security have also hampered the

distribution of adequate digital tools as part of government's own initiatives for enabling remote and digital education. Similarly, the government tightened its policy on foreign direct investment (FDI) to stop investments from any country that shares a land border with India. Mobile device manufacturers, electronics and PC makers, and telecom equipment players, among others, have all been affected by the move as they depend on imports from China for components and finished products. Moreover, shipments of laptops stuck at

ports or due to delayed clearance of mandatory certifications as per Indian Standards also led to delays in distribution. This has resulted in the laptop market facing serious uncertainties. India imports 87% of its laptops and 63% of its tablets from China, which are also used to achieve the government's digital education goals. Therefore, such policies have created a demand-supply gap, which is counterproductive to bridging the everwidening digital divide in the country.

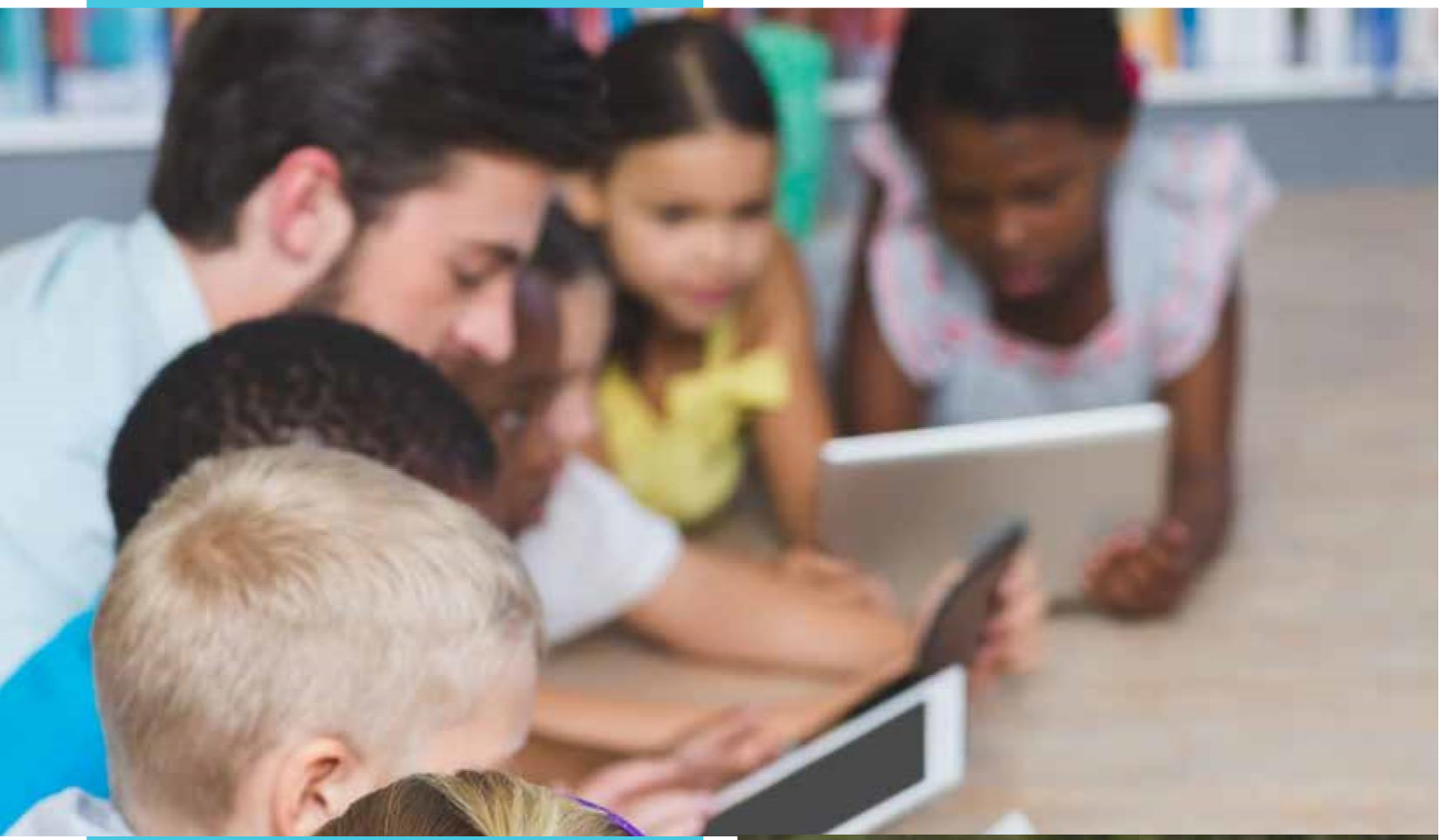
Jyoti Thyagarajan from Meghshala, an edtech platform that equips teachers to reach their teaching potential, said:

"We have to change our education outcomes. There are no two ways about us. There is a serious need to change the educational patterns, to change what we want out of education, and to change the way we deliver education. The need for digital education is beyond urgent, it is critical."

Gendered Digital Divide

While the pandemic resulted in online learning that created newer opportunities in the form of digital platforms, the new digital wave post-Covid-19 left women behind, intensifying the digital gender gap.

In 2020, 25% of the total adult female population



a gap of 40.4%

15% less likely

Disparity in Internet Access

This digital divide goes even deeper – firstly with the ruralurban digital divide, such that rural broadband penetration is only 29% against the national average of 51%. Second, there is an income-based digital divide between households. Given the average price for data is US\$ 0.68/GB in India, each GB of data costs low-income households (earning less than US\$2/day) 3% of their monthly income versus 0.2% for middle-income households (earning US\$ 10–\$20 per day).

Every 10% increase in India’s Internet traffic delivers a 3.1% increase in per-capita gross domestic product, according to a 2018 report by the Indian Council for Research on International Economic Relations. In addition, having Internet access is no guarantee that



one can use it. About 20% of Indians above the age of five have basic digital literacy but only 40% are digitally literate in the critical age group of 15 to 29 years - which includes all high school and college students as well as young parents responsible for teaching younger children. More than one in five Indians above 7 years still cannot read and write in any language. Over the last decade, literacy rates have increased from 71.7% to 77.7%, with the highest gains coming among rural women. Andhra Pradesh has the country's lowest literacy rate, at just 66.4%, significantly lower than less developed States such as Chhattisgarh (77.3%), Jharkhand (74.3%), Uttar Pradesh (73%), and Bihar (70.9%). Kerala remains at the top of the pile with 96.2%.

Covid-19 & the Adverse Impact on Education

Beyond the staggering impact on human life, Covid-19 has greatly disrupted access to education in India, with 247 million primary and secondary school students out of school.

While school systems in India and across the world have made efforts to reach students at home through various means, recent estimates of the impact on learning and socio-emotional wellbeing suggest that the poorest children will be hurt the most by the pandemic-related school closures.

Between March 2020 to February 2021, Indian schools were fully closed for 62% of instruction days, and partially for 38%. These school closures placed 320 million students including 158 million girls at risk of dropping out and reaching large learning gaps. The pandemic also affected an estimated 40 million migrant workers and those working in the informal sector (90% of India's population is engaged in this sector). In addition, the move toward technology-driven distance learning is preventing many migrant children from continuing their education. A survey across 18 states reveals that 46% of migrant children have discontinued their education due to Covid-19, but this is an incomplete picture – at the national level, there is a big data gap on child migrants and their needs which hampers better planning.

It must be noted that during this period, nearly three-quarters of rural students, across government¹/private schools, received teaching material over WhatsApp, and nearly 1 in 10 parents purchased a smartphone for online learning. The tablet market in India witnessed 116% quarter-on-quarter (QoQ) growth in Q3 2021, driven by back-to-school offers and a continuous need for new companion devices. A report by ASER states that while the percentage of enrolled children having at least one smartphone at home has risen from 36.5% to 67.6% between 2018 and 2021, only 19.9% of children in Classes I-II have access to the device whenever they require it. The access to smartphones increases with age, with 35.4% of students in Classes IX and above having constant access. Despite initiatives from the Central and



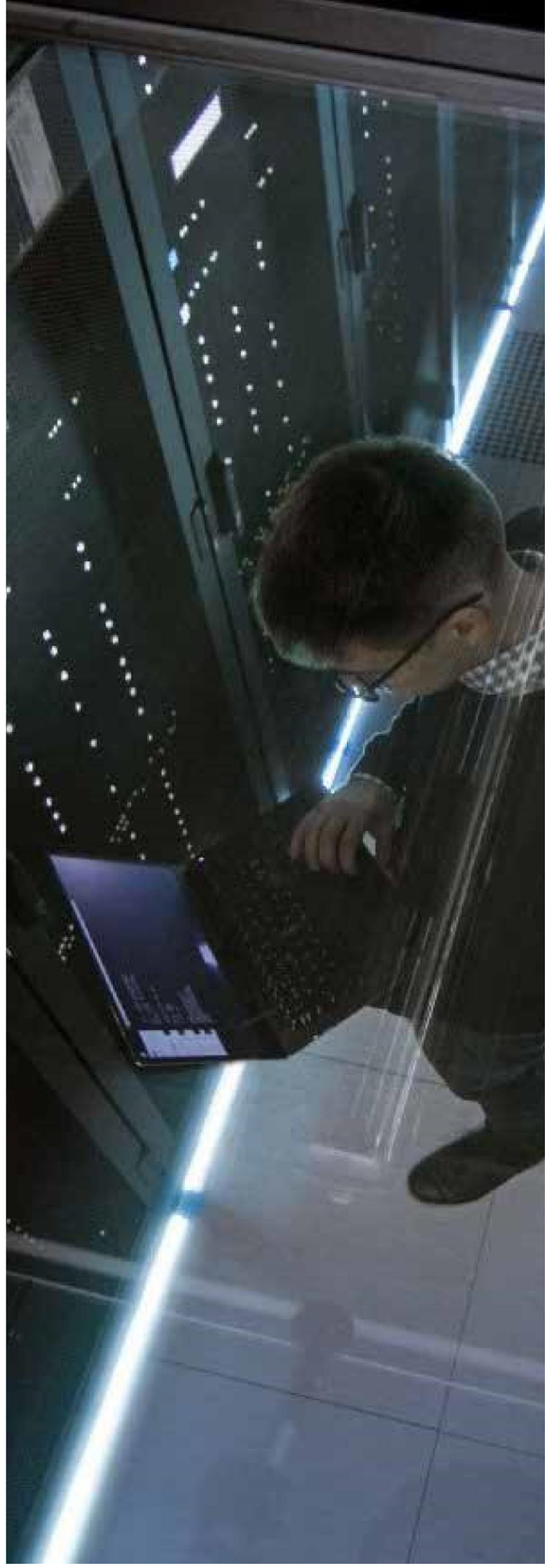
state governments, there has not been enough expenditure on improving the digital infrastructure for remote learning. In fact, in 2020-21, the Ministry of Human Resource Development budget for digital e-learning was reduced to INR 469 crore from INR 604 crore in 2019-20.

Impact of Digital Divide on Employment

In April 2020, the International Labour Organisation (ILO) estimated that nearly 2.5 crore jobs could be lost worldwide due to the pandemic. Currently, digitally skilled workers represent 12% of the workforce in the country. However, as per a report by McKinsey, digital skilling could create 60 million to 65 million jobs by 2025. Retraining and redeployment will be essential to help 40 to 45 million workers whose jobs could be displaced or transformed.

Therefore, it becomes imperative that the current and future workforce of the country are digitally savvy and have the requisite skills needed to fill these roles. The average worker will need to develop seven new digital skills by 2025 to keep pace with technology advancements and demand.

In addition, it is well documented that Science, Technology, Engineering and Math (STEM) skills are critical to enhancing employability across industries in India and globally. The country's National Science Foundation predicts that 80% of jobs in the next decade will require STEM skills, while technology company IBM estimates that STEM careers will offer 24% higher pay and longevity in the future.



Government initiatives to Improve Learning Opportunities

Despite being one of the largest and fastestgrowing economies in the world, India's public spending on its education has decreased from 14.1% in 2013 to 11.86% in 2018. However, the Budget 2020-21 has allocated INR 1,04,278 crore for the education sector - an increase of 11.86% compared to the previous year. The budget allocation for education for 2021-22 was INR 93,000 crores - a reduction of 6% from 2020-21.

India's education sector has witnessed a surge in technology-based solutions to support the continued learning of students during the Covid-19 lockdown. This includes core remote learning solutions (traditional tools such as textbooks and home visits, tech-enabled and mass communication solutions such as WhatsApp, YouTube, TV, and radio, and blended solutions.

The Ministry of Education has also launched several free digital e-learning platforms in partnership with several NGOs such as EkStep, Khan Academy and Azim Premji Foundation. Some of these initiatives include:

DIKSHA: Digital Infrastructure for Knowledge Sharing (DIKSHA) is an opensource national platform for learners and teachers to enable educational autonomy.

Teachers can undergo training on the platform, access tools to help them with their lesson plans and content explanation, as well as assessment of their students.

e-PATHSHALA: In this portal, the National Council for Education Research and Training (NCERT) has deployed audio, video, and e-books for grades 1-12 in different languages.

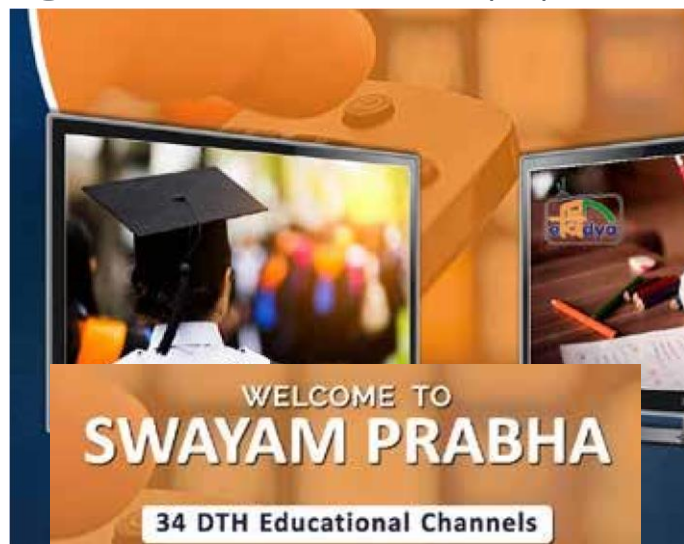
National Repository of Open Educational Resources (NROER): This portal has a total of 14,527 files including 401 collections, 2,779 documents, 1,345 interactive, 1,664 audios, 2,586 images and 6,153 videos in different languages.

SWAYAM: Is the national online education platform hosting 1,900 courses covering both school (grades 9-12) and higher education programmes.

SWAYAM PRABHA: Has 32 D2H TV channels transmitting educational content on a 24/7 basis. These channels are available for viewing across the country using Doordarshan (the government-run national television channel) free dish, settop box and antenna.

Impact of NEP on Students

The NEP 2020 is ambitious and envisions a complete overhaul of the education sector. The proposal to



allocate 6% of India's GDP to the sector shows the government's commitment to making the vision a reality.

NEP is primarily based on the foundational pillars of Access, Affordability, Equity, Quality, and Accountability. This means that gadgets should be integrated into the learning process to enrich the pedagogical quality of children and ensure their engagement in scholarly and co-curricular activities. Thus, NEP 2020 will open up new learning opportunities for students. Some of these include:

- Increase focus on the skill improvement and competency development of the students
- Make students future-ready by building 21st-century skills
- Help students focus on both academic and non-academic pursuits
- Provide various learning opportunities for pre-primary, open, and distance learning students
- Give access to counselling and other services for students

Impact on Teachers



Meeting the needs of NEP

The government needs to enhance the digital infrastructure of educational institutions and allocate adequate funds to integrate advanced technologies. The advent of mobile learning (m-learning) as a recognized area of technology-enhanced learning has led to the bridging of the gap between formal and informal learning. Thus, existing e-learning platforms such as **SWAYAM** and **DIKSHA** will be extended to provide teachers with a structured and user-friendly set of assistive tools for monitoring the progress of learners.

To achieve equitable and inclusive education, the policy reaffirms every citizen's right to thrive and contribute to the nation by bridging the social category gaps in access, participation and learning outcomes. The NEP has clubbed gender identities, socio-cultural identities, geographical identities, disabilities, and socio-economic conditions to create a new social group called Socio-Economically Disadvantaged Groups (SEDGs). NEP 2020 will provide the infrastructure support, innovative education centres, track students and their learning levels, facilitate multiple ways to learn that involve both formal and informal education modes, and a larger involvement of counsellors or well-trained social workers with schools.



How Technology Companies can Promote Digital Inclusion

Technology companies have a big role to play in promoting digital inclusion. They can, for instance, support schools by providing access to laptops and tablets, as well as free hotspot connections for their homes. This will ensure that no child is left behind when it comes to learning as they will be able to actively connect and engage with their classmates and teachers remotely.

To ensure that rural communities are also technologically equipped, service providers should prioritise the use of a fibre infrastructure — underpinned by intelligent software — that can adapt and meet the demands placed on it by businesses and the public. As of 2020, around 1.5 lakh gram panchayats out of a total of 2.53 lakh gram panchayats across India had received optical fibre cable (OFC) connectivity in the last five years. Initiatives such as the collaboration between technology major Lenovo and Meghshala have resulted in over 5,000 teachers getting trained in 2300 schools in Karnataka and Manipur. This partnership has assisted more than 210,000 students and 7,000 teachers across India in 2020-2021.

Through the Yuva Unstoppable-Tabletbased learning and lending initiative along with its NGO partner Yuva Unstoppable, **Lenovo** aims to provide about 2590 Make in India tablets to 79 government girls schools in Gujarat.

Tech companies should continue to focus on creating long-term partnerships and collaboration. For instance, in 2021, tech company **Intel** collaborated with the Central Board of School

Education (CBSE), the Ministry of Education and launched the AI For All program. The initiative is a four-hour, self-paced learning programme that demystifies AI in an inclusive manner. It is applicable to a student, a stay-at-home parent and to a professional in any field or even a senior citizen. The programme, available in 11 vernacular languages, aims to introduce AI to one million citizens in its first year.

Similarly, ed-tech platform **Byju's** launched an initiative with Niti Aayog called Education for All in 2020 and reached 3.4 million students. In 2021, the company revised its vision to empower 10 million children, up from 5 million, by 2025. Under the initiative, Byju's partnered with over 110 NGOs and launched its program in 26 states, whereby its educational content is loaded onto the devices with free access for students and teachers.

To empower high school girl students to thrive in a digital economy, technology companies have launched programmes for imparting digital literacy and coding skills alongside career development and empowerment. Lenovo's Agastya International Foundation also supports STEM education with mobile science labs in government schools in Bangalore, Delhi, and Mumbai reaching out to 8,400 children

Furthering the importance of STEM education at the grassroots levels, Verizon India tied up with the India Literacy Project (ILP), a non-profit organisation to distribute Science Lab in a Box kit in 60 Governmentrun schools in Tamil Nadu and Telangana. This initiative is expected to assist children in such schools gain access to grade appropriate skills and create pathways to productive careers.

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Technology Giants improving Accessibility, Employability, and Availability

Low-cost smartphones and affordable data with telecom infrastructure have presented new opportunities for technology companies to invest in India.

Google India, for instance, has been working to bridge the digital divide in several ways. Its Internet Saathi programme, a collaboration between Google and Tata Trust, claims to have helped 30 million rural women gain digital skills and build their online presence.

Google also announced investments in leading Indian startups **Glance InMobi** and **VerSe Innovation**, enabling them to further scale the availability of relevant and engaging content in different formats across various Indic languages.

localized content experiences across products like Glance and Roposo, while VerSe Innovation serves vernacular content in 14 languages through platforms like the Dailyhunt and Josh apps.

Similarly, **Amazon India's Delivering Smiles** initiative aims at reducing the widening digital divide in the country. Through the Delivering Smiles initiative, Amazon India will directly provide and facilitate the distribution of digital devices among students and young people from marginalised communities. The company will also directly provide 20,000 digital devices to underprivileged young people, in partnership with over 150 large and small non-profit organisations, impacting over 100,000 students across India.



Glance InMobi delivers visual, immersive and

The Road Ahead

Currently, India needs a stronger tech infrastructure to provide uninterrupted Internet access and electronic devices to students. Government and other authorities need to collaborate with telecom companies and undertake initiatives that increase the bandwidth of the network, and provide electronic devices and Internet packages to students. While policies pertaining to national security are extremely important, there is also the need for the government to take a balanced view, especially in areas that have a social impact before promulgating policy decisions under emotional duress. For instance, the banning of Chinese companies from participating in public procurement will only hamper the government's plans of making the country digitally equipped. A lot of government plans are contingent on the free distribution of electronics sourced from Chinese companies and a short-sighted approach will set India months, if not years back from achieving its set goals. Local electronics manufacturing should also be set up in the country which would add significantly to skillbuilding and job creation.

As an immediate measure, investments in more shared facilities and in the distribution of refurbished products or previously owned IT gear with sufficient residual life must be considered to bridge the gaps. The Tamil Nadu government has also sanctioned grants to distribute 11.72 lakh laptops to school students across the State. The UP

state government has also announced a similar scheme of free tablet distribution for students. In addition, initiatives like BharatNet should be used to provide Wi-Fi hotspots around the country, especially in remote areas. An early introduction of 5G networks by the telecom sector will also act as an impetus.

Technology companies must also partner with local communities to develop and expand digital learning programs. By leveraging technology and creating longterm partnerships, tech companies can benefit from developing new community footprints and a more localised and personal approach to populations who need access to the Internet the most. When bridges around digital inclusion are built, boundless opportunities for students and communities are created.



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