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CASE STUDY

India's distance learning response to the COVID-19 crisis

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Version 1

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Disclaimer We have made every effort to ensure that the information provided in this case study is correct and complete as of 24th June 2020. Due to limitations of our data collection, we do not claim exhaustive coverage of states' COVID-19 response programmes related to education. No part of this study should be considered an official position of the Government of India, respective state governments or their allied agencies and departments. TicTacLearn and Top Parent are EdTech initiatives supported by CSF.

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Key messages

1. In responding to the COVID-19 school closures and the Indian education system demonstrated commitment, resourcefulness and a sense of urgency.
2. Given limited data and evidence, an effective and sustainable state response relied on engaging political and senior bureaucrats.
3. States that had before the pandemic invested in technology and the development of local-language content were more resilient to the shock and could respond swiftly.
4. Given the rapid and widespread shift to distance learning in the context of limited internet and phone access, states had to deploy high-tech, low-tech and no-tech interventions as a part of their education response to COVID-19.
5. Initial response designs did not consider the needs of marginalised learners, especially girls. Some states are beginning to address the needs of learners with disabilities as their responses evolve.
6. Teachers played a crucial role in ensuring student participation in states' distance learning initiatives, and their feedback influenced the nature and delivery of learning content.

1 Introduction

India has the largest educational system in the world, with around 247 million students enrolled in 1.5 million schools. Of these students, 50% attend schools operated by government and local bodies. This educational system is spread over 28 states and 8 union territories that are geographically, linguistically, culturally and socioeconomically diverse (SDG India Index, n.d.). School children's learning outcomes also differ from state to state (NAS-MHRD, n.d.).

On 16th March 2020, by order of the central government, all the educational institutions in India were closed to slow the spread of the novel coronavirus 2019 (COVID-19). These school closures came towards the end of the academic year for most Indian states. The pandemic dealt a huge blow to the Indian school education system. To minimise loss of learning due to school closures, central and state governments sprang into action, designing and implementing education responses. In India, national-level education policy comes under the purview of central government, but states have significant autonomy in conceptualising and implementing state-level programmes related to education. This meant that states were able to design education responses to COVID-19 that were sensitive to their unique contexts and needs.

This study aims to gain a deeper understanding of India's education responses to the COVID-19 school closures and the role played by educational technology (EdTech) within this. We focus on primary and lower-secondary schooling in government schools, which covers 101 million enrolled students — or 40% of the total enrolled students in India. As there has been no unified national educational response, we have studied the actions taken by seven states: the National Capital Territory of Delhi, Gujarat, Himachal Pradesh (HP), Kerala, Meghalaya, Rajasthan and Uttar Pradesh (UP) (Figure 1) ('the states'). See Annex A for the methodology used to select these states.

Figure 1
May of Indian states selected for the study

Informed by primary and secondary research,[1] this study provides a brief overview of the digital learning initiatives in India pre-COVID, an analysis of the studied states' education response to school closures and a discussion of their plans for incorporating EdTech in the near future. It concludes with some policy suggestions for use of EdTech for in-school and at-home learning.

1 See Annex for a detailed discussion of our approach to primary and secondary research.

2 Digital learning pre-COVID

Over the past few years, India's central government has worked on several initiatives to strengthen the use of technology in education. These include e-Pathshala for ebooks content, the DIKSHA platform for digital teaching and learning content for teachers and students, and Swayam Prabha television channels for telecasting high-quality educational content. States have also invested in developing digital infrastructure and educational content, but their ability to integrate technology with the current teaching and learning frameworks varies significantly.

Information and communications technology (ICT) interventions in India have been largely hardware-focused, with the aim of improving students' digital-literacy in schools; at-home promotion and adoption of learning through technology have been very limited. Our research revealed that those states that had created or curated digital learning content before COVID-19 made online channels their primary education response to the pandemic.

3 States' educational responses to COVID-19

When school closures were announced in March 2020, the states launched a series of interventions using different technologies to ensure continued learning for students at home (Figure 2).

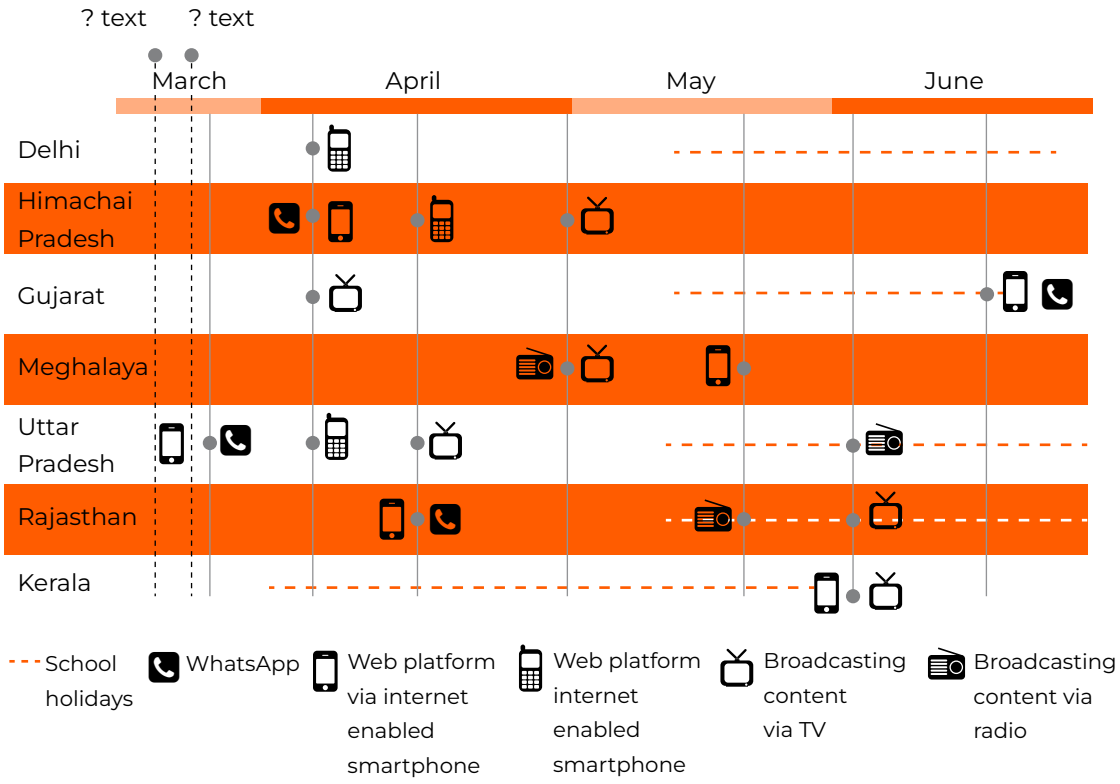

Figure 2
Timeline of state educational responses

The creation of WhatsApp groups and the broadcast of audiovisual content through television and online channels were common across multiple states. Radio was adopted by a few states where internet connectivity was a major challenge. Due to variable academic calendars, the states in our sample lost between 2 and 13 weeks of in-school learning due to the school closures.

3.1 What factors influenced the design of states' education response to COVID-19?

Our research suggests that the main factors that influenced and shaped states' education response were connectivity, capacity of education departments, content, and commencement of the academic session.

Access to the Internet and smartphones was a major driver of the states' response. While all states in our study initially prioritised the use of online technologies, those with relatively more substantive connectivity gaps had to consider other modes to deliver distance

learning, including low-tech and no-tech. For instance, in a state with poor connectivity like Meghalaya, it has become critical for schools to distribute printed content like worksheets to learners.

Over the past decade, several states in India have invested in improving the capacity of their education departments. This has included putting in place processes for integrating technology with the existing education models and training teachers to develop local-language content in-house mostly for TV and online media, as done by the state education departments of Kerala and Gujarat Rajasthan, Himachal Pradesh and Uttar Pradesh's education-focused programmes are supported by external technical partners with sector expertise and implementation experience. These partners have effectively augmented the capacity of state education departments and were instrumental in helping states develop and execute an effective response to the crisis. When the pandemic struck, the most resilient states were those that had the existing state capacity to mount a swift and comprehensive education response.

The availability of content in local languages played an important role in the speed of states' response and perhaps also in its effectiveness. Until recently, high-quality digital content for education was mainly available in English language only, catering to a niche market of private schools in India's urban areas. This is changing: state governments' content development teams and non-profit organisations are now creating engaging digital open-source content in local languages. To source content for their response, the states that we studied employed the following approaches:

- Curated open source content available in select Indian languages from content providers like TicTacLearn and organisations like Pratham and Avanti. This model was followed by other state education departments like Uttar Pradesh, Rajasthan and Himachal Pradesh.
- Created content using states' education department staff. Kerala developed all the digital content through its own teachers and resources. Similarly, Meghalaya and Gujarat mobilised a section of its best teachers and academic staff to create contextualised videos.
- Collaborated with content owners to offer free educational content. For example, TopParent in Uttar Pradesh, Khan Academy in Delhi and Bright Tutee in Rajasthan.

School calendars vary across Indian states and when schools closed, the states' responses were dependent on where the schools were in the academic year. States whose academic year had just begun or was well underway felt greater pressure to respond faster in order to avoid losing school instruction days. On the other hand, states who were starting their scheduled summer vacation soon after the close down, like Gujarat or Kerala, had more time to develop a response for the forthcoming academic session.

3.2 What technologies did the states use?

The aim of the educational responses was to reach the maximum number of students, and so the technology employed was shaped by internet and smartphone penetration and existing digital infrastructure. While India's urban elite and middle-class enjoys access to computers/smartphones and broadband internet, the same cannot be said of the large sections of the poor and rural populations. To bridge the digital divide, all the states

formulated strategies that use multiple modes of technology — an approach that can be dubbed 'high-tech, low-tech and no-tech'. Figure 3 depicts the range of technologies — from online mediums to print material deployed by the states. We describe the use of these technologies in the context of the device used by the end-user in the following sections.

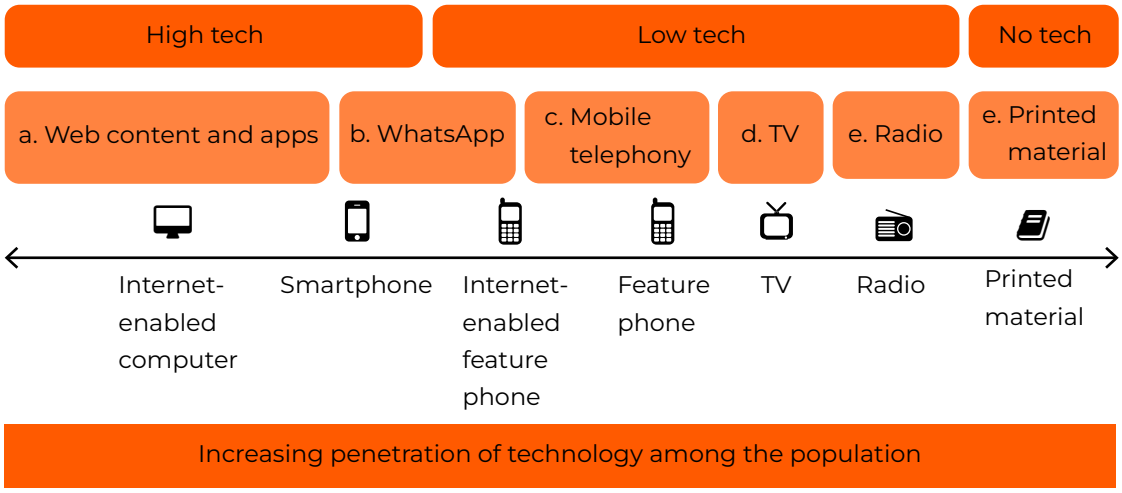

Figure 3
Spectrum of technologies adopted by states in their educational responses

Web content and apps

During the school closures, states uploaded content they had created and curated to their respective education department's website and YouTube channel Links to this content were then shared through text message, social media, TV, and newspaper advertisements.

- Kerala created and disseminated content in the local language for Grades 5–9 through state-owned VICTERS online platform, which was then streamed on TV, YouTube and Facebook.
- States like Madhya Pradesh, Uttar Pradesh and Himachal Pradesh endorsed the use of private non-profit education apps like Top Parent, Sampark Baithak and Teacher App.
- Classes were hosted on Zoom, Google Classroom and other platforms by several state education departments.

WhatsApp

WhatsApp played an important role in many states' response strategies. WhatsApp has emerged as one of the most widely used apps in India with a coverage of 400 million Indians (30% of the population) (Banerjee, 2020). The education departments of some states like Uttar Pradesh and Himachal Pradesh already had operational WhatsApp groups that they expanded in response to the crises. In response to the COVID-19 school closures, states have leveraged WhatsApp in two ways:

1. Forming cascade groups that allow different stakeholders at different levels — from state education officials to students and parents — to communicate instructions and share feedback.
2. Sharing educational content and formative assessments with the students, and as a helpline for addressing student queries.

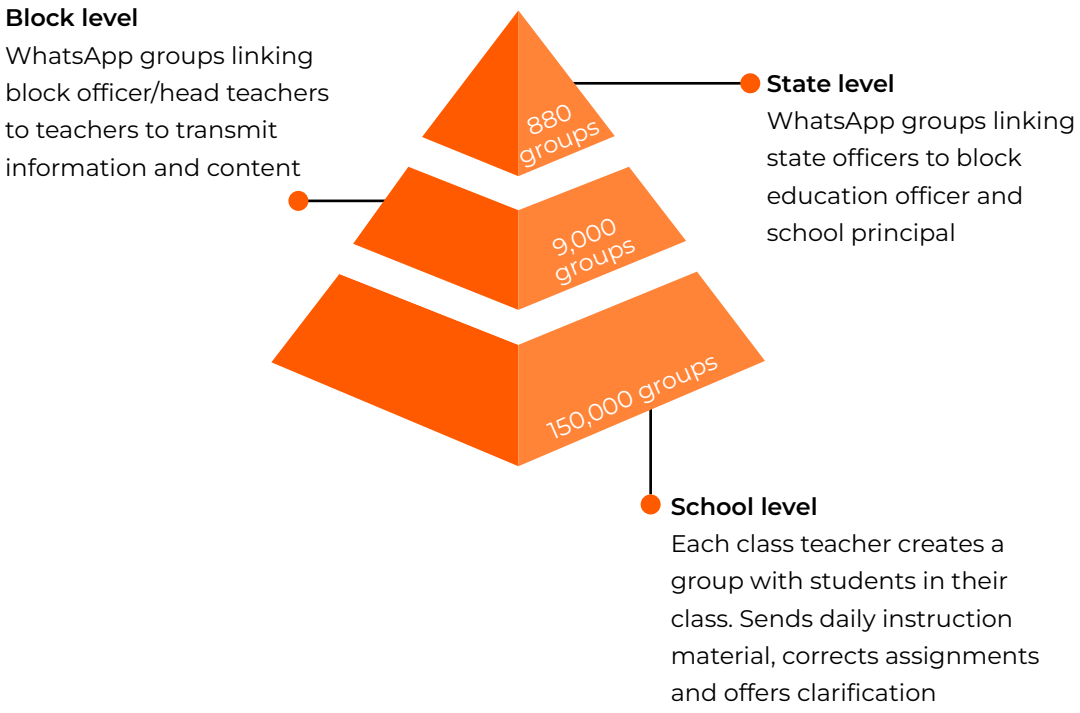

Figure 4
A three-level WhatsApp cascade model used in Uttar Pradesh

Some states also used WhatsApp innovatively. Himachal Pradesh partnered with a private organisation to launch a WhatsApp-based assessments chatbot to track the effectiveness of its digital interventions (Bansal & Bahri, 2020). In Rajasthan, the education department used WhatsApp to share with students every Saturday a quiz created in Google Forms via WhatsApp every Saturday to assess the week's improvement in learning.

Mobile telephony

State governments resorted to using basic mobile phone technologies to reach students without an internet-enabled smartphone. Smartphone penetration varies greatly between states and between rural and urban areas within the states limiting the reach of online and WhatsApp based intervention. A Pew Research Center study in 2018 documents that while only 24% of Indians owned a smartphone, 40% owned a feature phone (Silver, 2019). The basic mobile phone interventions included an Interactive Voice Response System (IVRS) through which students could listen to grade- and subject-specific academic audio content; and text messages (SMS) and phone calls through which teachers could motivate and support students to engage with the material shared on WhatsApp or via IVRS. In Delhi, parents received SMS messages and IVRS calls to conduct reading and socioemotional learning activities with their children through the Mission Buniyaad and Happiness Curriculum programme (Philip, 2020).

Television

Given the popularity of video content and India's previous experience of distance learning through television, the central and state governments incorporated television in their response programmes. Approximately 66% of Indian households have access to a television, making it one of the most effective means for delivering quality audiovisual content to

children at scale. States negotiated with the national broadcaster, Doordarshan, to allot a fixed time for education programming on its regional channel.

Some states, like Gujarat, Kerala and Meghalaya, created television content by recording teachers delivering lectures in special studios; some reused the open-source videos from their online initiatives; and some used a mix of both strategies. States also negotiated with cable television and direct-to-home operators to carry the Doordarshan state channel at no additional cost to users. Kerala and Gujarat had existing TV channels dedicated to education — KITE-Victers and Vande Gujarat, respectively. These channels were reinvigorated with additional high-quality content developed in-house by state educational departments and became central to Kerala and Gujarat's response programmes (Zee News, 2020; Oza, 2020).

Radio

Radio is believed to have extensive coverage across India, with government-owned All India Radio (AIR) claiming near-universal reach in rural areas. However, the states we studied for this case study did not have any recent experience of using radio for education and therefore lacked an adequate repository of content suitable for this medium. To overcome this, states partnered with UNICEF for radio education content and negotiated with AIR or private radio channels for programming slots. Meghalaya and Uttar Pradesh are among the states using radio to provide learning opportunities for children during the COVID school closures (Press Trust of India, 2020; Gupta, 2020).

Printed learning resources

In states like Meghalaya, Kerala and Himachal Pradesh, reaching learners who do not have access to internet, television or radio required dedicated initiatives. Some states, such as Himachal Pradesh, have begun distributing, door-to-door, printed teaching learning materials and collecting completed assignments. Meghalaya, Kerala and Uttar Pradesh plan to follow suit.

3.3 How did the responses address the needs of marginalised learners?

During the initial conceptualisation of the states' response programme, the issue of special needs of marginalised learners such as girls and children with disabilities or special educational needs did not feature prominently. Initially, it was thought that the school closures would last for only two weeks. And so, while state governments were aware of the needs of marginalised learners, their focus was on maximising the reach of the response programme broadly. As the school closures continued, this one-size-fits-all evolved. For example, Kerala's education department created educational content especially for learners with disabilities and uploaded it to YouTube.

Reports suggest that female students are likely to be disproportionately affected by the COVID-19 school closures (BS Web Team & Agencies, 2020), the distance learning initiatives in the states we studied have not focused on female learners. The digital divide is also gendered: girls' access to digital infrastructure is more limited than boys' — especially in low-income households where school closures might result in more domestic chores for girls. This highlights the limitation of online learning and suggests that reaching the household does not always translate into effective access to digital learning resources for all learners.

3.4 How were decisions taken during challenging times?

The state responses to the learning crisis should be considered in the context of education's increasing political salience in state elections. Politicians have an incentive to respond, and be seen to be responding, to the learning crises due to the pandemic.

Given the enormity of the challenge and the need to respond quickly, all the states in our study adopted a top-down approach to their response strategy. Figure 5 represents the governance structure for education in Indian states.

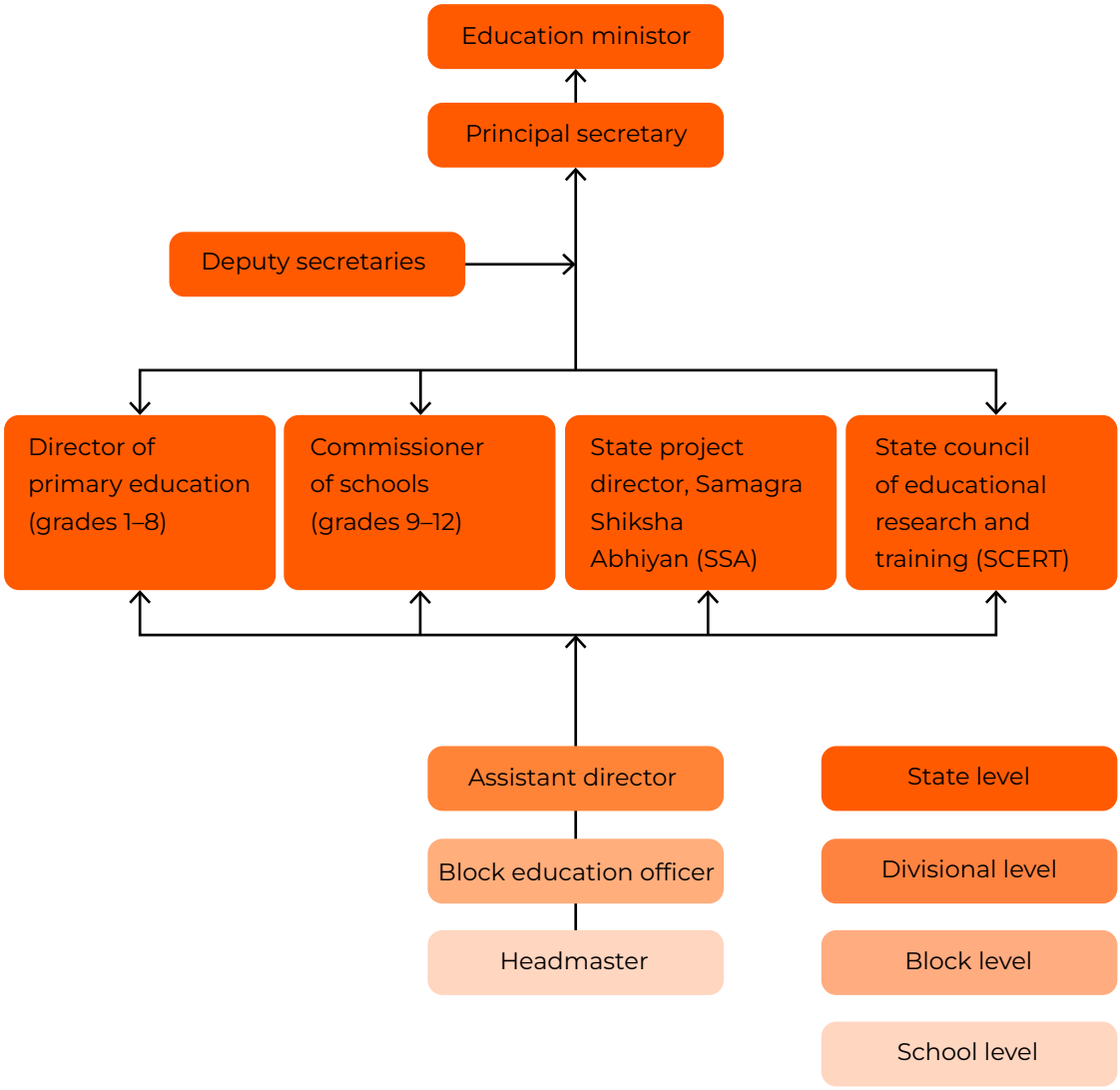

Figure 5

Governance structure for education in Indian states

The state-wide education response programmes were designed and implemented by senior education department officials, in some cases supported by external technical partners. The degree to which other stakeholders were consulted varied between states. Delhi and Kerala collected data to gauge students' access to internet, smartphones and television and calibrated their response programmes accordingly: Delhi emphasised SMS and IVRS interventions and Kerala moved digital devices that were lying unused in closed schools to community learning locations near students' homes. Final decisions pertaining

to states' response programmes were usually taken by the Principal Secretary and Education Minister of the state.

Teachers, district officials and political representatives from the states that were part of this study were deeply concerned about the digital divide. Their feedback influenced state governments to focus on low-tech and no-tech interventions in addition to internet-based initiatives. States also used branding to create a unique identity to their response and develop relevant messaging and support for their initiatives. Indeed, the states' Education Ministers or the Chief Ministers were seen championing the response programmes.

Our interviews suggest that most states used existing budgetary resources to finance their education response. It is likely that the costs of procuring devices for millions of students without access to digital infrastructure would have been prohibitive for the states we studied — at least in the short term. Kerala is a case in point. Here, the issue of the state's digital divide came to the fore when a student committed suicide due to distress at being unable to attend online classes as her family could not afford a smartphone and did not have a functioning TV set (Jacob, 2020). The tragedy underlined the urgent need for the government to address the issue and it made a state-wide appeal to corporates, political organisations, non-governmental organisations (NGOs) and civil society, asking them to donate digital devices to help improve access to learning (Philip, 2020). The donated devices were placed in common viewing centres in government facilities across Kerala, significantly reducing the number of learners without any access (Rakesh, 2020). In most states, many for-profit organisations and NGOs provided states with access to their content and/or platforms for free for the duration of the pandemic, effectively reducing the costs of responding to crisis for the states.

4 Sustaining the momentum

How do states intend to sustain their use of EdTech?

States are thinking about how the momentum created in the adoption of digital learning in the past three months can be sustained. The role of technology in education in the immediate future will be influenced by the COVID-19 experience. 'Blended learning' — which combines more traditional classroom-based learning with online educational materials and interactions — will remain crucial in the aftermath of this crisis and beyond.

The WhatsApp cascades that stakeholders created and used for communication, feedback and decision-making during COVID-19 are likely to continue and expand. Discussion with states in the study suggest that this is due to WhatsApp's prevalence and its effectiveness in communication and content sharing. Given its reach, television will play an increasingly important role. Twelve new grade-specific school education channels — including content for learners with disabilities — are to be launched as a part of the Pradhan Mantri e-Vidya program, a national initiative to promote online learning. States will provide students with content they have developed or curated as a part of their COVID response using WhatsApp cascades and television for self-learning, and the materials will also be used in classrooms. For example, Uttar Pradesh plans to install smart televisions in all schools for utilising digital educational content in school. States will also create content in local languages or invest in contextualising existing open-source content.

States' experiences of responding to COVID-19 have underscored the crucial role that teachers play in keeping students and their parents or carers motivated and engaged in distance learning. Training and motivating teachers will therefore be central to the success of any future at-home or blended learning programme. As part of their COVID responses, states like Rajasthan and Kerala have made progress in instituting recognition and rewards systems for teachers facilitating distancing learning (NDTV, 2020). Many states have expressed a desire to move teacher professional development and certification completely online.

With more EdTech and distance learning options emerging all the time, policymakers will be faced with decisions about which products or content to use. To make an informed choice, states will need to systematically collect data on the reach of the technology or approach, how learners are using and engaging with it, and students' learning outcomes of the students. Complementary efforts, such as educating parents and carers on how to use technology to facilitate their child's learning at home should also be considered. Fundamentally, sustaining momentum for the widespread adoption of EdTech would involve responding to the challenge of limited and inequitable access to the internet.

5 Conclusion and policy suggestions

The COVID-19 pandemic and resulting school closures have changed students', teachers', parents' and state education departments' perceptions of the role of technology in education. The discussion has shifted from 'Is it worth spending money on ICT in schools?' to 'How can technology be used to make the learning process continuous and effective, both in school and at home?'.

The education response of Indian states highlights the important role that digital learning plays in mitigating learning crises and demonstrates future potential for EdTech. However, structural challenges remain — particularly limited access to internet and digital infrastructure both at home and in school. While declining internet and device costs will organically increase access over time, ensuring that this increase is efficient and equitable will require policy response.

Firstly, investments in digital infrastructure to improve access need to be increased significantly, especially in the remote areas of India like the North East. Care needs to be exercised to direct investments in education technology to those modalities that are supported by evidence. Investments in community models to reach learners — like Kerala's common viewing centres — can be explored as an interim measure and in rural areas where it is difficult to reach individuals. The central and state governments in India need to significantly increase its spending on ICT hardware and quality educational content and software in schools.

Secondly, focus on content. The education departments of states we studies should look beyond instructional and animated videos to more engaging and interactive content and formats such as game-based learning and personalised adaptive learning. The central government has taken an important step forward in this area with its Vidyadaan initiative, which solicits contributions of content for the DIKSHA portal.

Lastly, the policy approach to EdTech and the design of related programmes should systematically consider and respond to the needs of marginalised learners, especially girls and students with disabilities.

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Annex methodology

Selecting states for the study

For this study, we carefully choose a set of Indian states using broad criteria including performance on National Achievement Survey (NAS), internet penetration, geographic and linguistic diversity, and feasibility of collecting information over a short period of time. In Table A, Indian states are mapped according to their relative levels of broadband penetration and their performance on NAS.

*NAS 2017–18 data

Source: authors analysis and representation

Table A

State selection rubric

We selected at least one state from each quadrant, keeping in mind the aforementioned factors of the selection criteria, and converged on the National Capital Territory of Delhi, Gujarat, Himachal Pradesh (HP), Kerala, Meghalaya, Rajasthan and Uttar Pradesh. Figures A, B and C capture the diversity of the chosen set of states for this study on a few key dimensions namely: enrolment in government schools, wireless broadband penetration as a percentage of the population, and percentage of students enrolled in rural schools.

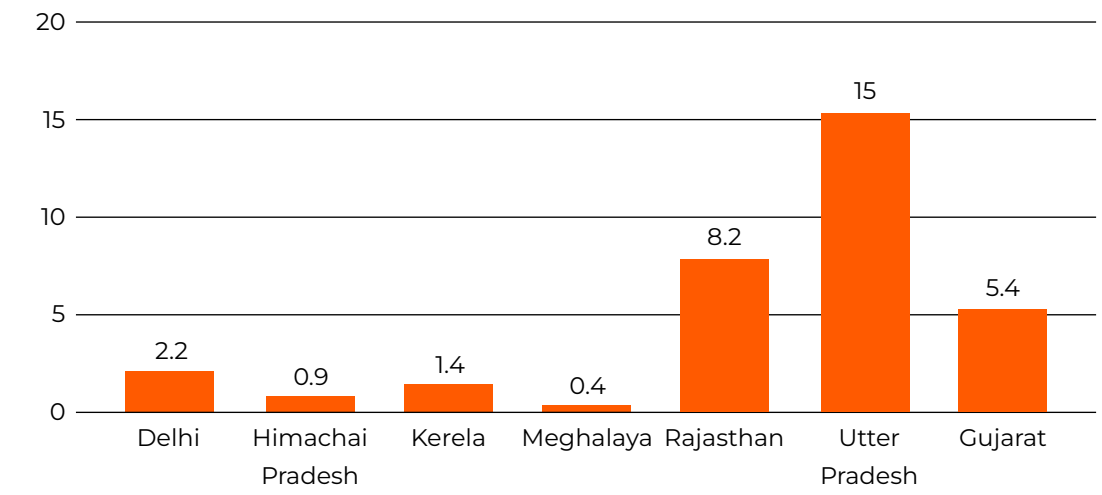

Figure A

Students enrolled in government schools by state (millions). (Source: UDISE 2017/18)

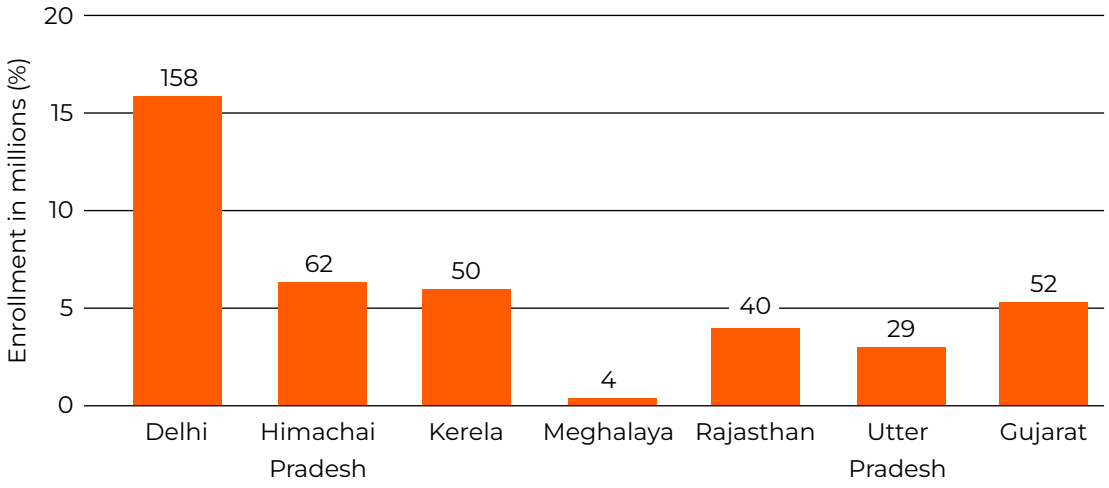

Figure B

Wireless broadband subscriptions by state as % of population. (Source: Telecom Statistics, 2019)

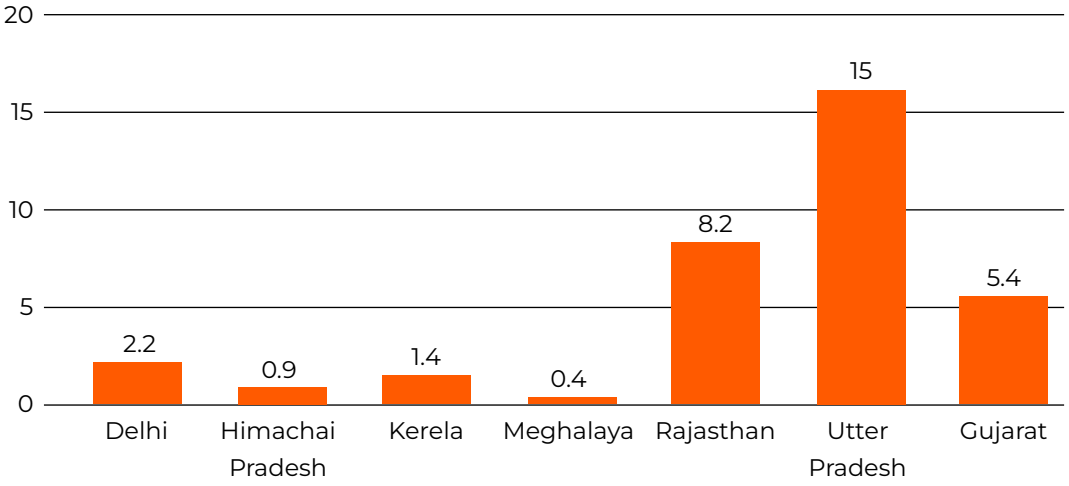

Figure C

Percentage of government school children enrolled in rural schools (compared to the government school children enrolled in all government schools in the state) (%) (Source: UDISE 2017/18.)

Primary and secondary research

Our study is based on both primary and secondary research. Primary research involved collecting information through semi-structured interviews of a broad set of stakeholders. Secondary research entailed a desk-based review of various publicly available sources of information on states' education responses to COVID-19. This two-pronged approach provided us with data, information and insights, which form the basis of analysis in this study.

The stakeholders interviewed for this study included: senior government officials from the states in our study sample (except in the case of Rajasthan, where the interview with the government official could not take place) and organisations, agencies and individuals involved in the implementation of the programmes in those states. The interviews were based on a list of questions (see Table B). Overall, we conducted eight interviews for this study. Our secondary research involved an extensive review of government websites, press releases, analysis and op-eds, press releases, presentations and statements by government departments and officials since January 2020.

Information area		Questions (focus: school Grades 1 to 8)
1. Size of the problem	a	How many government schools, teachers and students are affected: by grade and by gender?
2. Response conceptualisation and timelines (G1–8)	a	When did summer holidays commence and end? Any changes owing to COVID? When did the new academic session start?
	b	What was the name of the digital learning programme and what were its elements? (for example, infrastructure needed, language translations available, training of teachers, and so on). When was it launched? If it was done in phases, please provide the dates when the phases were rolled out.
	c	What were the steps that the state was already taking, pre-COVID, to integrate online/tech-enabled learning with school education?
	d	How were digital content tools, repositories or technologies created, identified and/or accessed?
	e	Has the state used the services of external partners (NGOs, consultants, implementation agencies, and so on) to advise on or operationalise the response to the crisis? How?
3. Communication cascade	a	What was the state's communication plan for each element, to reach education authorities in districts, school principals, teachers, parents and students?
4. Anticipated issues and mitigation (G1–8)	a	What were key issues anticipated in the execution stage and how were they mitigated?
	b	What were issues anticipated for serving more marginalised groups of students, such as girls and learners with disabilities? Has the state sought to mitigate the effects of these issues? How?

5. Mobilisation effort, training and professional development	a	What were the methods used to ensure high participation of students, teachers and parents? How were they trained to use the resources?
	b	How has the state responded to the ongoing professional development need of teachers?
6. Data tracking	a	What are the data points used to track the programme in terms of (i) usage (how many participate); (ii) engagement (how actively they participate); (iii) efficacy (how much they learn)?
7. Decision-making during challenging times	a	How was the data (from UDISE, State MIS, other sources) used to design and calibrate the state's response? What was the process of arriving at policy and implementation decisions relating to students' continued at-home learning in view of the COVID school closures?
	b	Which stakeholders engaged in and were consulted in the process outlined? If any additional budgets were required to be released for the COVID response, how was that accomplished?
8. Unanticipated problems and their addressal	a	What are the unanticipated problems that have arisen? Do the unanticipated problems vary by student sub-groups based on gender, socioeconomic background and so on?
9. Access	a	What actions has the state taken to overcome the obstacles of device availability, internet access and cost of such access?
	b	What actions have been taken to make TV or radio programming available in the state?
10. Pointers to the future and reflection	a	What are the long-term learnings for the state from the COVID school closures and response? What went well and what could be improved?
	b	What are the government's plans for education system recovery and the factors influencing it? What is the potential for new, innovative and expanded uses of technology in education?

Table B

Case study questionnaire

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