Perspectives *by*
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Implementing EdTech at home in India

Experiences and Learnings from
Ei Mindspark during COVID-19

Executive Summary

Lockdowns due to COVID-19 have kept students away from schools for over a year. To ensure students continued learning, Ei made Mindspark, its Personalised Adaptive Learning software, remotely accessible to children online. However, facilitating its use, especially in remote and rural areas, proved challenging, with learnings to draw from for EdTech interventions by other organisations.

First, Ei had to secure permissions and cooperation from government officials and schools. More importantly, it had to reach students, parents and communities on the ground at a time of restricted mobility.

Field teams faced issues of limited digital connectivity, low digital literacy and language barriers in the process. Given that EdTech solutions are a radical departure from schooling-as-usual in many parts of the country, helping students and parents understand the benefits of such interventions was challenging. Where students lacked access to devices at home, implementation teams established community labs periodically in their localities, taking laptops and tablets for students to use. To maximise outreach at the last mile, Ei engaged well-networked NGOs and volunteers. The best-performing students were awarded tablet-computers and stationery kits to incentivise usage. Despite these challenges, Ei reached over 1,26,000 students in this period across 10 states.

Student usage data from Ei Mindspark in this period revealed the following:

- Over 81,000 of these students used Mindspark for more than 5 hours in the year
- More older students used it than younger students
- Students in urban India used Mindspark for longer than students in rural India
- More female students used Mindspark than male students, for longer periods of time, and were better represented among top-performers
- Though more students were reached remotely during the pandemic than in schools beforehand (over 2x), quality of usage decreased with fewer students achieving 'level-jumps' in this period

Key learnings from this experience, which may aid other organisations, are:

- Create solutions that can be implemented at scale to actively engage governments
- Gain the support of high-leverage authority figures like local officials and leaders to add legitimacy to interventions
- Devise long-term implementation strategies to gain the trust of stakeholders at the last-mile
- Engage in extensive and regular outreach to familiarise students and parents with EdTech solutions
- Partner with well-networked organisations and individuals to maximise reach
- Develop alternate implementation channels to enable access for those students without devices
- Make EdTech interfaces engaging (through gamification, etc) to increase use in unmonitored settings
- Sensitize students and parents on secure internet usage to prevent exposure to illicit material and scams

The last 18 months have been unimaginably challenging for India's children. Lockdowns due to COVID-19 have kept them out of school, worsening an existing learning crisis. School reopenings, as currently planned, may be marred by intermittent closures if COVID-19 cases rise and new variants emerge.

The long-term losses from COVID-19 school closures may be severe – far surpassing learning loss experienced during the pandemic itself. A study by Azim Premji University from 2021 noted that between grades 2-6, 82% of students in mathematics and 92% of students in language had lost at least one specific ability in this period. Long-term economic consequences will likely follow; the World Bank estimated a loss of $5,813 in lifetime earnings per child in South Asia whose learning has been affected in this time.

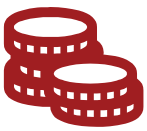
School closures in this period accelerated the development and adoption of education technology (EdTech), with stakeholders across the system employing digital means to help students learn remotely. There has been much innovation in this regard; teachers recorded lessons and shared educational material over messaging apps, state governments used TV networks to transmit educational content, etc. Households with computing devices and internet access increasingly adopted digital learning aids, bringing what were earlier niche products into the mainstream.

82% students

In Grade 2 to 6, in India, have lost one specific ability in Mathematics

92% students

In Grade 2 to 6, in India, have lost one specific ability in Language



$5,813

Estimated loss in lifetime earnings per child in South Asia whose learning has been affected due to the pandemic.

Mindspark by Educational Initiatives (Ei) is one such digital learning platform. Based on 20 years of pedagogical experience and research, Mindspark is a Personalised Adaptive Learning (PAL) software that dynamically adjusts content for students based on their individual learning levels and rate of progress. It is available in nine vernacular Indian languages for classes 1 to 9, with its content mapped to India's National Curriculum Framework. Ei Mindspark's cost-effective positive impact on learning has been established by numerous 3rd-party evaluations conducted by J-PAL,[4] IDInsight and Gray Matters India, and documented by T*he Economist*, *Stanford Social Innovation Review*, *Harvard Business School*, and others. On average, students users have achieved 2x learning gains relative to non-users in multiple evaluations.

[1] A study of the 2005 Pakistan earthquake's impact found that, 4 years later, those students who missed three months of school were the equivalent of 1.5 years of learning behind those who did not.
[2] *Loss of Learning during the Pandemic* (Rep.). (2021, February). Retrieved from https://archive.azimpremjiuniversity.edu.in/SitePages/pdf/Field_Studies_Loss_of_Learning_during_the_Pandemic.pdf
[3] Sukumar, T. (2020, November 11). Lost school time might lower lifetime earnings for lockdown-hit children. Retrieved from https://www.livemint.com/education/news/lost-school-time-might-lower-lifetime-earnings-for-lockdown-hit-children-11605076717454.html
[4] Muralidharan, Karthik, Singh, Abhijeet, & J, A. (2016, December 8). Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India. Retrieved from https://www.nber.org/papers/w22923

Bringing Ei Mindspark to homes in India

Due to school closures during the pandemic, Ei Mindspark (which is usually implemented in schools through computer labs) was made available for remote access. Students could use it on browsers via unique log-in credentials. With the support of CSR funders and philanthropists, Ei's field teams engaged with students, families, communities and schools to encourage Mindspark usage in this period. **Between June 2020 and May 2021, Ei was able to reach over 1,26,000 students across 10 states, with over 81,000 using it for 5 hours or more.** Figure 1 shows the various states from where students accessed Mindspark in this period.

The transition to Ei Mindspark at home opened up possibilities but also presented many challenges. With expensive labs no longer necessary to enable access, many more students could be reached. However, convincing students, parents and communities of Mindspark's benefits was difficult, especially given the difficulties brought about by the pandemic. The process was fraught with trial-and-error and required constant innovation and outreach by field teams. Figure 2 explains Mindspark's adapted Theory of Change in this context to ensure that learning continued for children.

This paper seeks to document this experience, sharing insights that contribute to a holistic understanding of education during COVID-19. Though it does not presume to have answers to all problems encountered, it raises relevant issues that an organisation must address if attempting similar interventions. In this way, it contributes to larger process-discovery documentation for the implementation of EdTech at home and in communities in capacity-constrained settings, especially in times of crisis. Figure 3 provides an overview of the processes undertaken by Ei to ensure Mindspark reaches every home and learning continues for each children.

Even though Pratham's Annual Status of Education Report[5] showed a significant increase in smartphone access among children from rural areas from 35.1% in 2018 to 61.8% in 2020, for millions of children, the last year has been challenging. Kept away from school, they may have suffered setbacks to their learning that will be long-lasting.

What's worse, the coming year does not offer great clarity. If and when schools open, returning will be difficult. These students will be in higher classes and taught a tougher curriculum that they may not be ready for. Here, tools like Ei Mindspark offer hope. By helping children learn at a level appropriate for them, it can help mitigate and remediate learning losses in a targeted manner. It can also help teachers identity areas where students need help. Hopefully then, for thousands of other Mindspark users, the impact of the pandemic on their learning remains minimal, and they can continue from where they left off.

[5] *Annual Status of Education Report 2020.* (2020, October 28). Pratham Education Foundation. Retrieved from http://img.asercentre.org/docs/ASER%202020/ASER%202020%20REPORT/aser2020nationalppt.pdf

Mindspark Online is currently being used by 1,26,000 students in 10 states across India:

- Himachal Pradesh
- Uttarakhand
- Delhi
- Uttar Pradesh
- Rajasthan
- Madhya Pradesh
- Gujarat
- Maharashtra
- Andhra Pradesh
- Tamil Nadu

Figure 1: States from where students accessed Ei Mindspark during COVID-19

Ei adapted the programme's Theory of Change in light of the new context and challenges, to ensure students continue making meaningful gains in literacy and numeracy skills.

INPUT ACTIVITIES

Activities for smartphone users

- Driving a "Mindspark at home" program across India
- Regular engagement through phone calls to incentivize usage of Mindspark at home
- Leveraging IVRS for sharing educational stories/activities with students

Cross cutting supplementary activities

- Engage teachers to encourage usage of Mindspark at home and Diksha app by students
- Capacity building of teachers on Zoom, sharing of student reports, etc.

Policy & Advocacy

- Engagement with government leadership on ICT and EdTech

OUTPUT COMPONENTS

- Students can access Mindspark through either smartphones or other means
- Students receive basic dosage of the learning content and intervention
- Teachers attending training on digital learning via virtual means, reports on students being shared
- Thought leadership to inform the ICT policy and future of EdTech in India

AGGREGATE OUTPUT

- Number of students reached via remote learning interventions are maximized
- Number of states and its stakeholders engaged on the programme are maximised

LONG-TERM OUTCOMES

- Students absorb content and improve their conceptual clarity
- Recognition of the efficacy of the initiative amongst stakeholders and the ecosystem

Figure 2: Ei Mindspark's adapted Theory of Change in light of the COVID-19 pandemic

Ei Mindspark's Implementation Process

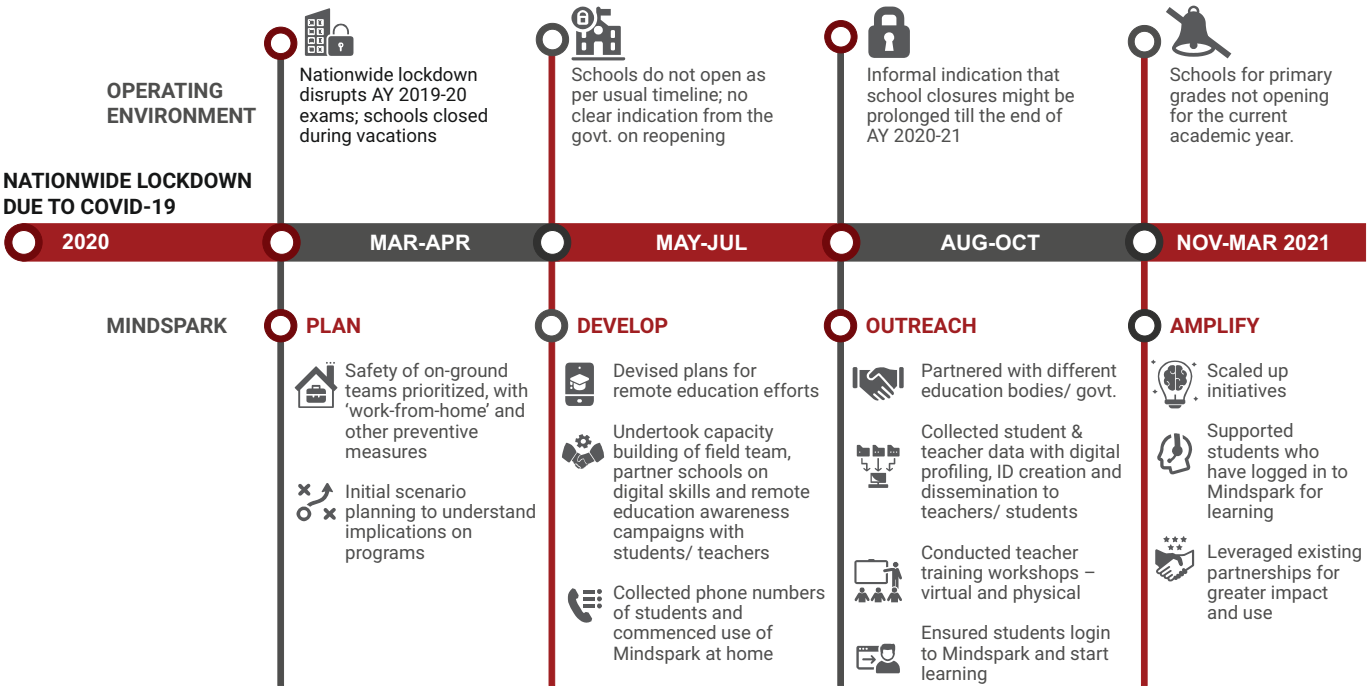


Figure 3: Ei Mindspark's implementation plan in light of the changing circumstances caused by the COVID-19 pandemic.

To implement Mindspark, Ei had to undertake the following: 1) Seeking approval from governments; 2) Engaging with schools and teachers; and 3) Reaching students on the ground. Discussion and outreach in each phase came with its own sets of challenges and learnings.

1

Negotiating with Goverments

Government approval was necessary for schools to give Ei student contact details. Additionally, their approval also helped legitimise the endeavour among stakeholders on ground.

While government education departments were indeed looking for remotely accessible educational interventions, they prioritised solutions that a majority of students could use. Given Mindspark's dependence on computing devices, some officials were sceptical of its potential. Additionally, state capacity was stretched thin at this time and focussed initially on public health efforts. Permissions, therefore, took time to come and active government engagement with Mindspark remained limited.

Where government officials were previously familiar with Ei and Mindspark, implementation was smoother. For example, Ei had set up Mindspark labs in multiple districts of Rajasthan since 2017, and stakeholders in the state had seen the programme's benefits over the years. They were, therefore, more amenable and encouraged adoption amongst schools even as formal processes took time. Conversely, when expanding into new districts in Himachal Pradesh, some block-level officials were suspicious of claims of free access to Mindspark for students.[6] Only after continuous outreach and orientation sessions did they eventually permit project implementation.

[6] All Mindspark licenses given to students are sponsored by philanthropic and multilateral funders.

Schools provided contact details of students' families. Additionally, Ei's field-teams also sought teachers' assistance in contacting students and encouraging Mindspark usage. Ei conducted detailed orientations to familiarise school administrators and teachers with Mindspark for this.

Unfortunately, schools and teachers played a limited role in outreach. While some encouraged students to use Mindspark, they remained the exception, not the rule. This was understandable, given their considerable burdens at the time. They had to find their own ways to teach the school curriculum remotely. Furthermore, in many states school teachers were co-opted for both pandemic relief work and election duties, placing significant demands on their time. Because of this, in Himachal Pradesh, teachers even petitioned local officials to limit involvement in external projects. While some interventions were put on hold, Mindspark could continue as here, team members approached students directly, requiring minimal engagement from teachers and schools.

Some teachers also expressed reservations about such external interventions. In Nandurbar, Maharashtra, teachers noted that previous projects with external organisations, despite beginning enthusiastically, halted soon after. They were therefore hesitant to devote time to initiatives that would not last.

2

Engaging with Schools and Teachers

Schools were crucial intermediaries in the implementation of Mindspark at home. They not only provided contact details but also proved to be a link between the students' family and the programme team.

3

Reaching Students On-Ground

To enable usage on the ground, Ei conducted digital profiling of all students, undertook remote and in-person orientations, and established community labs.

1. Digital Profiling

Ei's primary targets for remote usage were students whose families possessed computing devices (primarily smartphones). Reaching them was challenging and required constant innovation, given there were no established channels of communication or outreach. Ei conducted a digital profiling of students to understand the current needs and requirement. Figure 4 explains the various categories of students delineated as part of it.

First, field teams and Ei's call centre contacted parents using details shared by schools. They aimed to introduce families to Mindspark and share login credentials. Ei's call centre reflects this increased activity; the call centre alone made 118,234 calls between April 2020 and March 2021, compared to 15,239 calls between April 2019 and March 2020. Inbound calls to the call centre more than doubled from 1,659 to 3,229 as users sought assistance. This was over and above direct outreach by field teams.

Reaching parents, however, was difficult. Phone numbers shared by schools were often invalid or unreachable. Just over 40% of calls from the call centre successfully connected. Even amongst those families that were reached, many only had basic mobile phones, not smartphones. For example, of the approximately 12,000 phone numbers shared in Nandurbar, only half were reachable, and only about 10% belonged to families with smartphones.

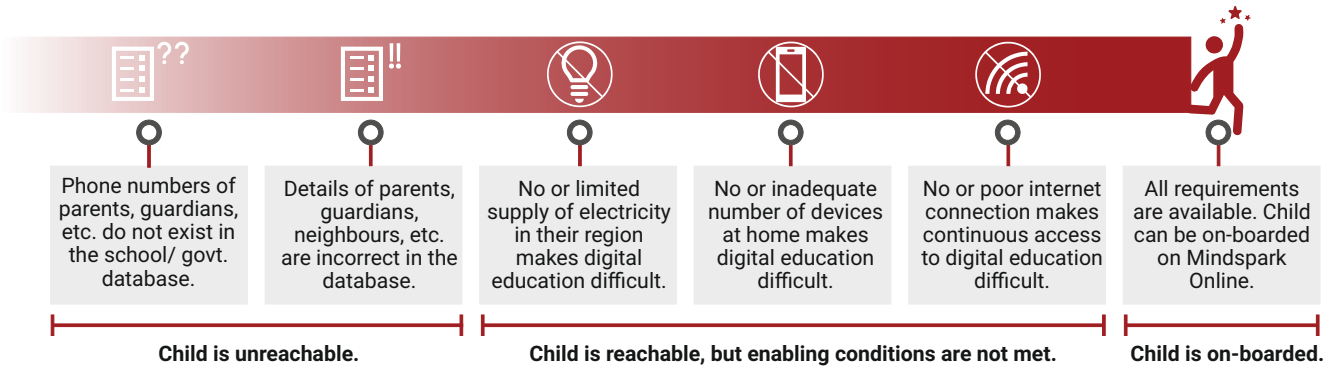


Figure 4: The Digital Profiling exercise conducted by Ei as part of Community Engagement.

2. Surmounting Low Digital Literacy and Language Barriers

Even amongst students in families with smartphones, low digital literacy levels and language barriers hampered outreach. Especially in remote areas, people often spoke regional dialects that team members did not. In such cases, team members would request that neighbours or other family members who did speak a common language or dialect be given the phone instead. After introducing families to Mindspark, team members would share login credentials and the website link over SMS. However, people were often unaware of terms like “User ID”, “Password” and “link” (at least when expressed in English). The login credentials shared were also in English; this required them to change the keyboard language on phones, which parents were not always able to. To solve this, children (who were often more comfortable with technology) were asked for assistance if possible.

Remote orientations like these had limited effect. Therefore, when lockdowns lifted, field teams visited students in-person in their localities to introduce students to Mindspark. In situations where schoolteachers were visiting villages to distribute learning material, Ei’s field teams accompanied them to simultaneously spread awareness of Mindspark. Positioning Mindspark as an initiative supported by schools helped legitimise programme in the eyes of students and parents. Ei also partnered NGOs and volunteers on the ground, hoping their human resources and familiarity in local networks would increase uptake. Though not always successful, in many places these partners could reach students faster than Ei’s team members.

Even when families did have smartphones, children were not always able to use them. When lockdowns were lifted, parents returned to work and so children did not have access to phones. Even when parents were home, they were hesitant to let children use their phones, afraid that their children, especially younger ones, may damage the devices. While only 20-30 minutes of daily Mindspark usage could help students learn effectively, given that children also had to use phones for other schoolwork, parents were worried that extended screen usage may be harmful. Where elder siblings had smartphones, they were unwilling to let their younger siblings use them, fearing they would access private files and messages. There were additional concerns with regards to child protection with reports of children inadvertently viewing pornographic content on smartphones belonging to elders. Even when children could use their parents' phones, there were competing demands on their attention; schoolwork shared by teachers also had to be completed.




Students using Mindspark in at home in Himachal Pradesh and Rajasthan during the pandemic.

Students using Mindspark in Community Labs in Uttar Pradesh and Maharashtra during the pandemic.

For these reasons, students did not learn as much as they might have if using Mindspark in schools. Data on level-jumps[7] reflects this. Therefore, while Mindspark's user base approximately tripled from 57,000 students to over 150,000 students between April 2020 and 2021, the quality of usage, measured in time spent, questions answered and level jumps obtained, diminished

3. Establishing Community Labs and Incentivising Use

Because of limited access to devices at home, Ei's field teams periodically set up community labs where students could use Mindspark. Field teams identified locations like community centres, *panchayat* offices etc. where children could gather while maintaining social distancing. They then informed parents and students of these labs and convinced them to attend. Finally, they would take laptops and tablets to these locations, supervising student usage.

Occasionally, team members faced resistance from communities that worried these would lead to COVID outbreaks. Such labs were also easier to establish in urban and peri-urban areas where student density was greater and distances to travel shorter, than in rural and remote regions where students were spread out across large distances. In the rural district of Nandurbar, for example, community labs could only be set up occasionally. In the city of Lucknow, meanwhile, they were established daily. Between 5,000-6,000 students here used these labs for almost 10 hours each in language and mathematics, far exceeding usage in rural areas.

To incentivise enrolment and encourage usage, Ei rewarded high-performing students. Generally, top performers in each district received tablet computers to help them study. In some cases, students were also given stationery kits. These awards were presented in ceremonies by important local officials and frequently covered by local media. This added to Mindspark's prestige and generated awareness regarding the programme. Over time, this increased enrolment in some states. In Himachal Pradesh, for example, access was originally given only to 15 top-performing students in each class in schools. However, as Mindspark gained popularity, even those students previously not given access sought to use it. This led to a policy of voluntary enrolment, wherein any student who wished to could register and over 12,000 students did so.

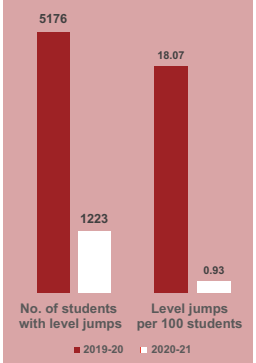
[7] A 'level jump' is an increase in learning level that a student achieves while using Mindspark. The 'levels' correspond to those set by curricular content, i.e., a student who learns at a class 3 level (regardless of what class they are actually in) is able to answer questions from established set class 3 curricula.

Understanding Ei Mindspark Usage

Even where students had access to Mindspark through devices at home, there was no guarantee they would use it regularly, unfortunately. In 2019-20, in one project, 5,176 of 28,639 students had 'level jumps in math. Though the reach of the same project expanded to over 130,000 students, there were only 1,223 level jumps that took place. This amounts to about 1/5th the number of level jumps per student in this period.

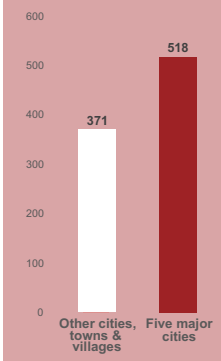
Usage Quality (Level Jumps)

Level Jumps in Mathematics



Usage by Geography

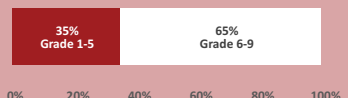
Avg. min. used per student



In general, Mindspark access was hampered by the digital divide, with students from urban areas using it on average for longer durations than those from smaller towns. Data shows that students from five major cities - Ahmedabad, Bhopal, Delhi, Lucknow, and Mumbai - used Mindspark for an average of 518 minutes, while those from smaller cities, towns, and rural areas used it for an average of 371 minutes.

Usage by Age Groups

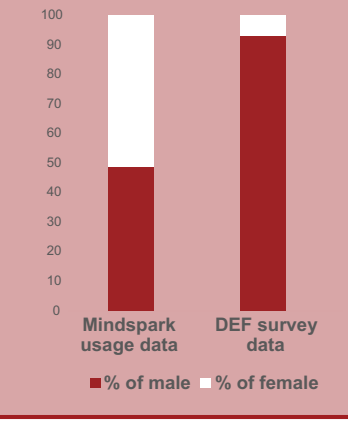
% of users in different grades



A 2017-18 NSS Study showed only 7% of children between the ages of 5-14 were able to use the internet. Mindspark usage data testifies to the lack of access to devices amongst younger children – about 65% of all Mindspark users were from Grade 6-10, while only 35% were from Grade 1-5. In Rajasthan, students from Grades 6-10 used Mindspark for 314 minutes on average, while students from Grades 1-5 used it for 267 minutes.

Usage by Gender

Male v/s female users in Maharashtra



However, we see not all characteristics associated with the digital divide applied to Ei Mindspark. Most studies have shown low access to digital devices amongst girls and women, especially in rural areas. For e.g., a 2018 NSSO Study found that while 13% of rural residents aged five and above had access to the internet, only 8.5% of females did. In Maharashtra, a 2020 survey by the Digital Empowerment Foundation (DEF) showed that only 6.9% of internet users below the age of 14 were girls, while 93.1% were boys. However, across India, Mindspark usage data shows that 51% of users were girls in class 10 and below. In Maharashtra, 6,668 girls used it versus 6,339 boys. Not only did more girls use Mindspark, but they also used it for longer. On average, across India, boys used it for 370 minutes in the year, while girls used it for 413. Girls also featured prominently among the top performers. In Lucknow, where students were awarded tablet computers for exceptional usage, 5 of 9 tablets were awarded to girls. Similarly in Himachal, among the top 40 performers, 23 were girls.

A Mindspark at Home Success Story

Lavi Kumari, aged 11, has been a standout performer over the last year. Though she struggled in school earlier, she began using Mindspark thanks to the *P&G Shiksha* programme and found it convenient because she could learn at her own pace. In the last year, she solved over 90,000 questions across 55 topics on Mindspark at home. While she earlier learned at a 4th grade level, she can now understand concepts of grade 8! You can watch here full story here.

Key Learnings and Recommendations

Create solutions that can be implemented at scale to engage governments
Active government engagement implementing EdTech remotely, especially in emergency circumstances like the pandemic, will be directed towards solutions that can reach a majority of students. However, the support of government officials, legitimises interventions in the eyes of users and stakeholders on the ground and is crucial to obtain.

Engage high-leverage authority figures like local influential leaders to legitimise interventions
EdTech interventions might seem unorthodox or unnecessary to stakeholders on the ground, especially if implemented in addition to schoolwork. To help students, parents and teachers buy in to the programme, support of authority figures like local government officials, school administrators and community leaders is crucial.

Devise long-term implementation strategies to gain the trust of stakeholders at the last-mile
Stakeholders on the ground, especially schools and teachers, may be sceptical of external educational interventions because these are often short-lived and, therefore, not worth investing time in. Devising long-term implementation strategies that clearly list inputs, outputs and outcomes will help develop their confidence in the same.

Engage in extensive & regular outreach to familiarise students & parents with EdTech solutions
EdTech solutions are a radical departure from schooling-as-usual, especially if implemented remotely. Helping parents and students understand the benefits of such interventions, especially when implemented in addition to schooling, is crucial. For this, regular outreach and nudges are necessary to ensure regular usage. However, repeated follow-ups may irk parents; a balance needs to be achieved for successful outreach.

Partner with well-networked organisations and individuals to maximise reach
Successful uptake of new interventions like EdTech depends on familiarity with implementing organisations. Therefore, while expanding into new geographies, it is important to partner with local individuals or organisations that are well-networked in these regions. Their familiarity with local languages, customs, and authority figures can catalyse enrolment.

Develop alternate implementation channels to enable access for students without devices
Limited access to devices like smartphones at home will hinder EdTech implementation at scale, especially in remote and rural areas. To overcome this, alternate channels of delivery, such as community labs, can be set up. Here, devices owned by the implementing organisation can be made accessible to students periodically in their localities. If labs are established in different locations, this can also ensure that a single device serves multiple students across areas.

Make interfaces engaging and reward good performers to increase use in unmonitored settings
Even when all other conditions are met, EdTech interventions that hope to be used consistently in unmonitored settings (such as at home) must be highly engaging, through the use of gamification, animated content, videos, etc. Otherwise, students may get distracted by other content online when using digital devices. Additionally, awards and material incentives for high-performing students can generate positive awareness regarding interventions and increase usage/enrolment.

Sensitize parents and communities to increase child safety online
In addition to orientation for the EdTech platform itself, implementing organisations should conduct digital safety awareness programmes for parents and students. This is to ensure that when using devices in unmonitored settings, children are not exposed to illicit content or fall prey to fraudulent messages.

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Educational Initiatives Private Limited (Ei), is India's leading assessment research and education technology organization. Founded in 2001, it is inspired by the vision of creating a world where children everywhere are learning with understanding. Over the past two decades, Ei has undertaken over 80+ projects with 50+ government and civil society partners (16+ languages, 40+ detailed studies published) across geographies, socio-linguistic backgrounds in India and abroad, for more than 10 million students across different grades. With offices in Bangalore and Ahmedabad in India, Ei has 350+ staff members specializing in different aspects of assessments, technology, training and project management. The top executives at Ei serve/have served as advisors on boards of several educational committees for Governments India at the state and central level.

Ei conducts large scale assessments in government and private schools to help diagnose and improve student learning levels. Mindspark, its Personalised Adaptive Learning software, helps over 300,000 students across India learn at a level and pace most suited to them. Mindspark has received widespread international recognition and approval by several including UNESCO, JPAL, Harvard Business School, World Economic Forum, World Bank, and many others.

Ei acknowledges the support of its on-ground partners and State Governments in implementing Mindspark at home during the COVID-19 pandemic.

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