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National
Skill Development
Corporation
Transforming the skill landscape

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AIM
ATAL INNOVATION MISSION

Digitization of Education Ecosystem

redseer

Digitization of Education Ecosystem

Preface

Over the last few years, the internet has changed everyone's lives. Today, in a few clicks we enjoy home-delivery, online shopping, healthcare services and more even in the hinterland with easy access to the internet. But, the genesis of all these began from the selling of books online.

At this juncture, the current operational 1.5 million schools and 55 K colleges, that form the base for formal education in India, stands at an inflection point of their technological adoption journey. Like many other sectors, Covid-19 as has been an unfortunate catalyst for digital transformation, and in the case of education, the use case and need realisation for technology adoption is stronger than ever before.

A paltry 15-20% schools had access to computers in working condition before Covid-19. Schools and other education institutes were caught off guard after the onset of Covid and subsequently induced lockdowns. However, despite low technology maturity, both in terms of (a) device/ infrastructure readiness and (b) teacher's technological readiness, schools were remarkably resilient in adjusting to the "new normal". From innovative uses of messaging apps to teacher training, adoption of live classes and admin support – institutes for the first time are discovering the potential for technology to impart education, create long-term learning outcomes and democratise access to quality education in India.

As schools and colleges slowly start to reopen, Education institutes must now sustain the technology adoption and further embrace their digital journey. National Education Policy 2020 is a welcome first step by the government to create systematic push for digital adoption by educational institutes and further uplift the quality of education and service levels in education.

As technology in education gets mainstream, the bar for products is also getting higher. Technology providers – both front-end (e.g. software/ platform providers) and back-end (e.g. cloud) must collaborate with institutes and teachers to create relevant solutions and address the massive gaps that exist in the market.

Thereby, it will be important for all stakeholders – policymakers, institutes and technology providers to work closely and leverage the potential of technology to create an impact on the state of Education delivery in India. Next few years will be really exciting to see how this market progresses, and which business models are able to sustain in the long run. Through this report, we have taken an attempt to decode this exciting Indian Education Institutes digital transformation opportunity. Hope, you find it an insightful read.

For any queries or feedback, please feel free to reach out directly to me at anil@redseer.com.

Anil Kumar
Founder & CEO
RedSeer

Acknowledgement

This research is a joint undertaking between IAMAI and Redseer Consulting. The primary authors for the report are Anil Kumar, Anuj Kumar and Abhishek Gupta.

We appreciate the overall guidance support and structure provided by National Skill Development Corporation (NSDC) and Niti Ayog - Atal Innovation Mission to help bring out this report.

We would also like to acknowledge Jasbir Juneja, Bhanupreet Singh Saini, Nilotpal Chakravarti, and Amitayu Sengupta in helping out structure the report and research for this project. Additionally, we acknowledge the support provided by Sanghamitra Kar Purkayastha, Ankit Verma and Namrata Honnalli for editorial and reserach support.

We are especially thankful to the education institutes, teachers, parents, students, and technology providers, who participated in our interviews and surveys.

Methodology

We reached out to all the stakeholders to build a deep understanding of status quo

	Parents/ student (Level K-8)	High School Students (Level 9-12)	College Students	Institute Ad-ministrators/ Teachers	Technology Provider
1. Profile[1]	Parents of Junior level students Students in Higher middle school	High School students from level 9 to 12	College students from Engineering and non engineering education stream	Teachers and administrators across education system levels	Current and ex-employees of Ed Tech facilitators and content providers for K12 / college / reskilling categories
2. Data collection Method	Telephonic discussions/ Survey	Telephonic discussions/ Survey	Telephonic discussions/ Survey	Telephonic in-depth discussions	Telephonic in-depth discussions
3. Sample Size	100 (Survey) 20-25 (IDIs)	100 (Survey) 10-15 (IDIs)	100 (Survey) 20 IDIs	10-12	12-15

1.Sample Notes :

Schools (K12)
National/ Regional Chain – CBSE (Such as Kendriya Vidyalaya, Vikash Vidyalaya, etc.,)
Others CBSE (low income; monthly fees – less than 1500)
Others CBSE (high income - monthly fees – higher than 1500)
IB/ ICSE Curriculum
State Board – Govt. & Private

Colleges
Engineering – Govt. & Private
Others Education stream (Such as Commers, Arts etc,)

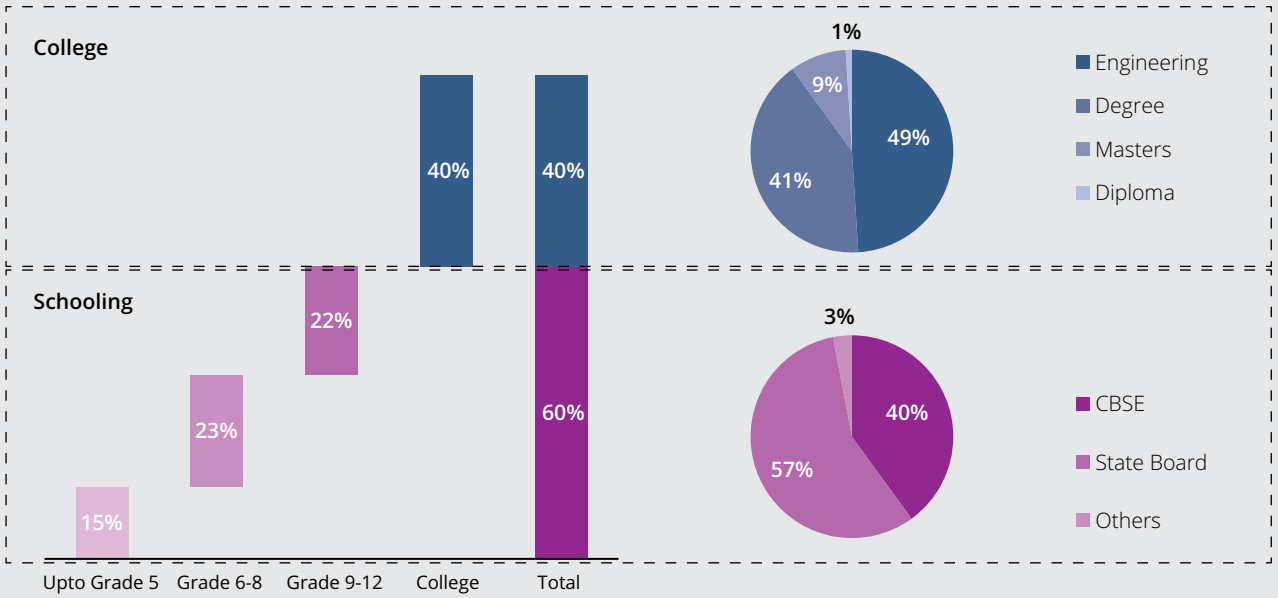
IDIs - In Depth Interviews

In addition to ~100 connects with schools, colleges and Teachers, We **reached out to over 300 students** across India to understand their digital acceptance for education and the challenges they face in this journey. We conducted telephonic reach outs with the students and parents in the K12 segment and college-goers. The discussions were conducted in the last week of August and early September to understand the overall impact of COVID 19, understanding the initial impact of the pandemic and how trends post the lockdown was lifted.

We conducted the discussion with a total of 316 students and parents combined. Below is the sample distribution based on the demographics of the respondent.

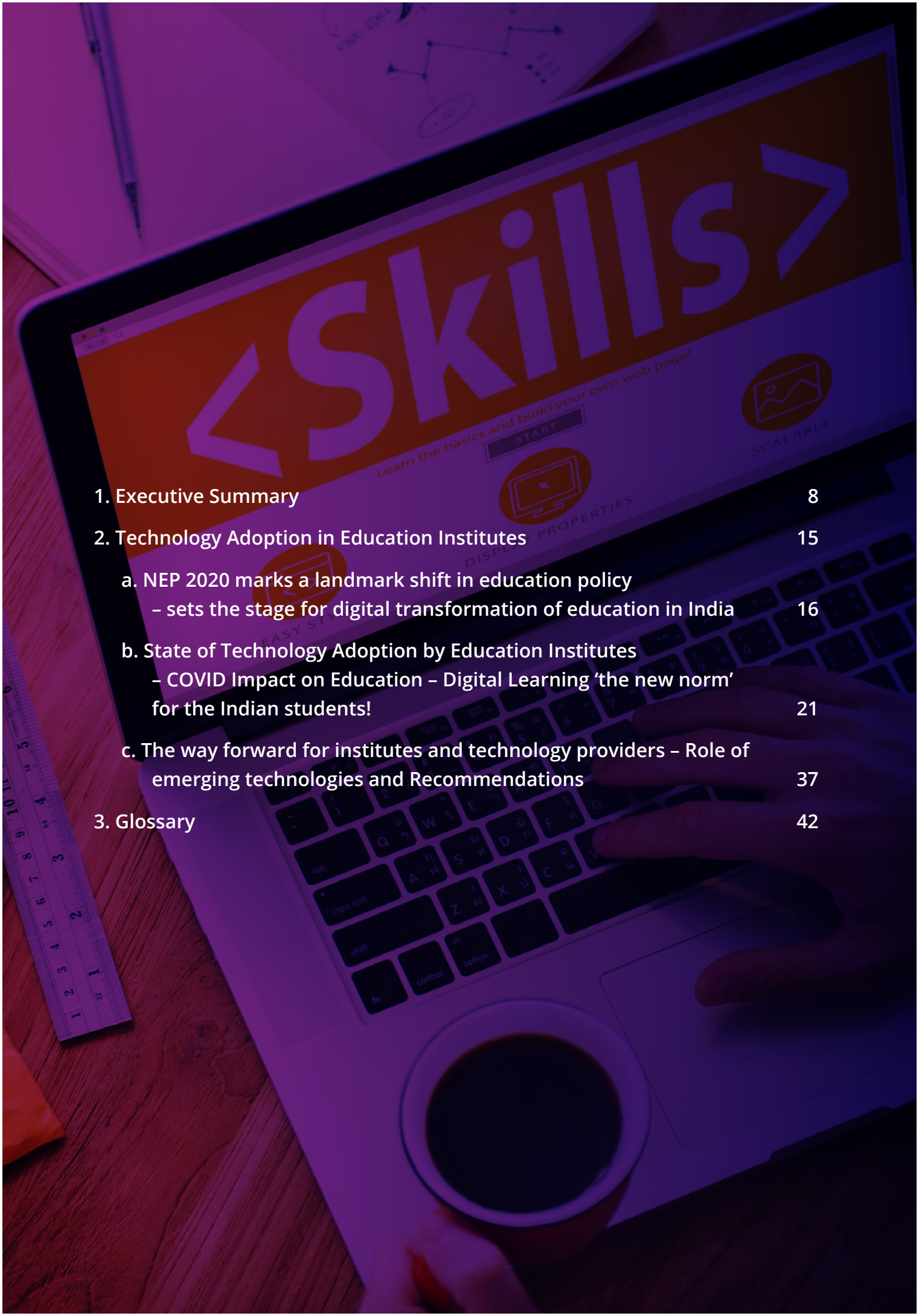
Student & Parent Research Details

Student and Parent Reachout - Split by Grades and Course Type
N=316



The research was sampled proportionately among K12, engineering and non- engineering students across India wherein school vs college students were in a 6:4 ratio to **achieve unbiased perspective of the education landscape.**

We also ensured there is fair representation across city types **from across the country**. 40% of the interviews were conducted in Metro and Tier-1 cities while the rest 60% were from Tier 2 and smaller cities. The city sample is based on respondent's current location from where s/he is accessing the education through digital channels



Executive Summary

Key Recommendations for the Education Ecosystem

Stakeholders

Education Institutes, Policymakers and Technology Providers

Action Items/ Pillars

1. Sustain and build on technology adoption after Covid

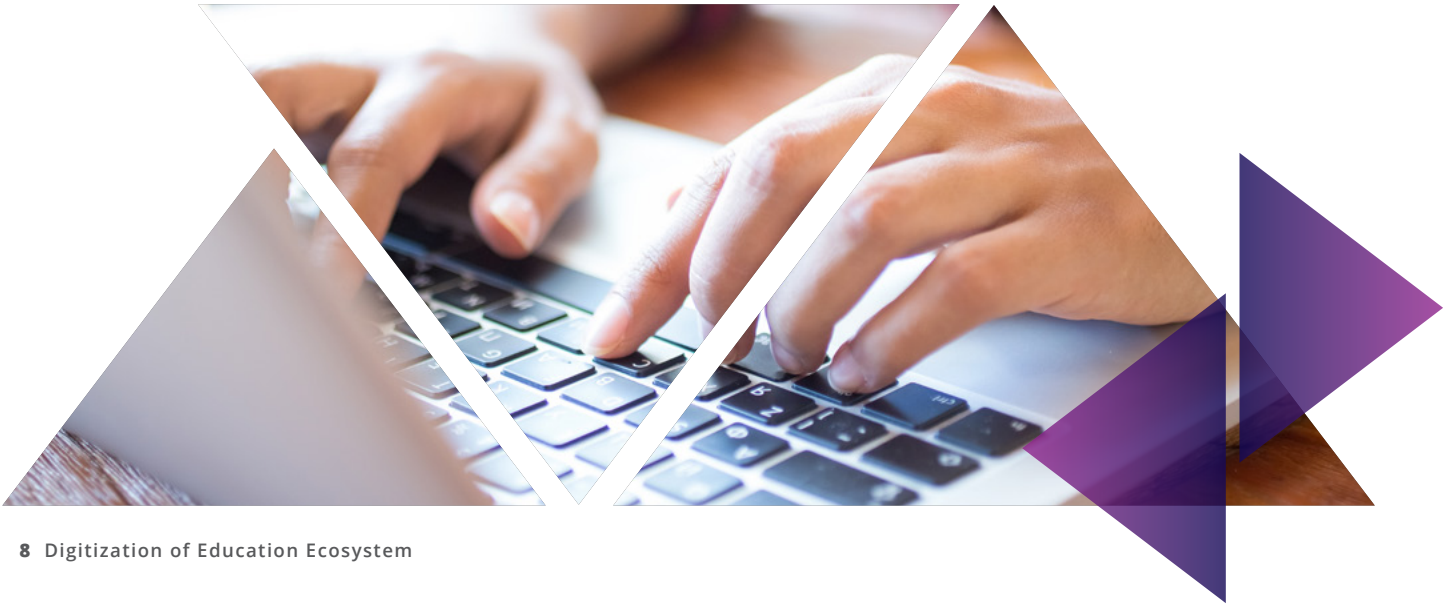
2. Create teacher centric products

3. Provide regional language and multi device support

4. Focus on delivering learning outcomes

Required Support/ Enabling Infrastructure Base

5. **Device & Digital Content –** to increase accessibility and affordability
6. **Cloud Infrastructure –** to enable technology delivery at scale in a secure manner
7. **Skill Upgradation –** to increase technological aptitude and readiness

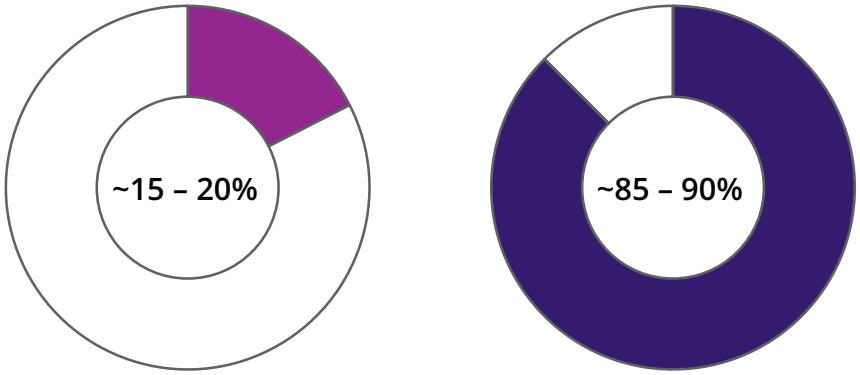


1. Sustain and build on technology adoption after Covid

The onset of Covid-19 hit schools and colleges particularly hard as it shut down their core operations. The prolonged lockdown – particularly in case of schools and colleges, exposed their weak tech readiness as they lagged on infrastructure to swiftly make a transition to online learning (particularly in K12 where only 15-20% of the schools had a working computer).

Number of Educational Institutes with working computers

Educational Institutes with Working Computers
Pre Covid State, 2020



K12

Total Schools: ~1,500 K
Schools with working computers: ~260K

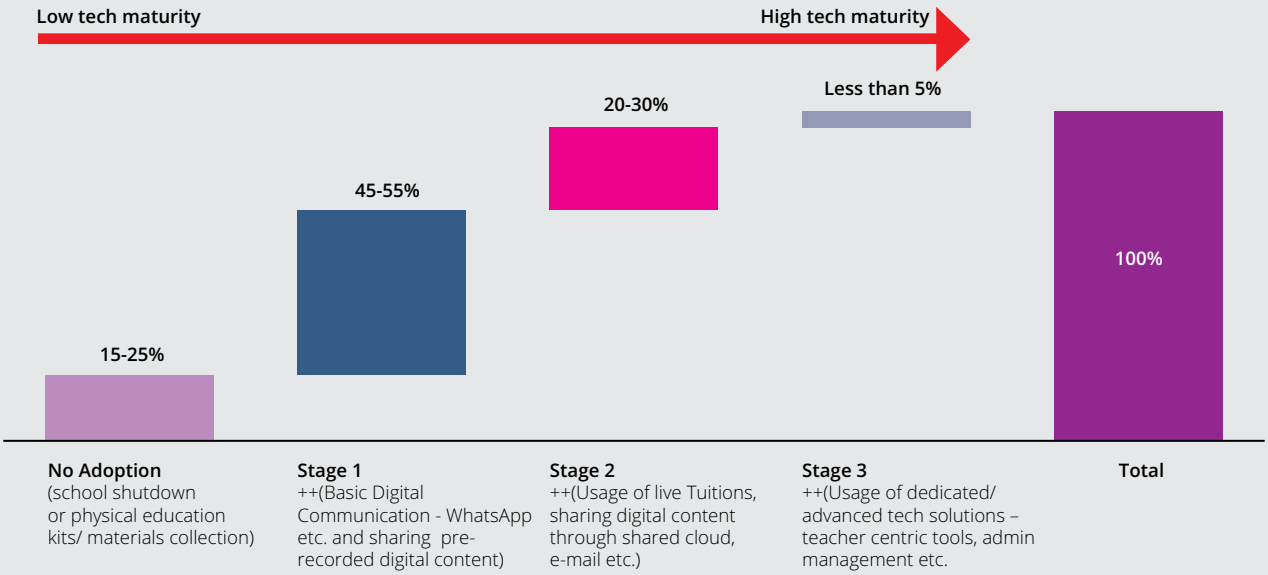
Higher Education

Total Colleges: ~55 K
Colleges with working computers: ~50K

Source: DISE, AISHE, AICTE, Expert Interactions (N = 70), RedSeer Analysis

Despite low readiness, both schools and colleges showed agility in responding to the lockdowns and adopting various technologies to ensure that teaching continuity is maintained. While more mature schools and colleges, particularly serving to mid-high income segments – moved to live online classes, the masses found saviour in WhatsApp as a tech-based communication medium.

Level of technology adoption among education institutes (K12) after Covid



Source: Expert Interaction(N =70), RedSeer Analysis

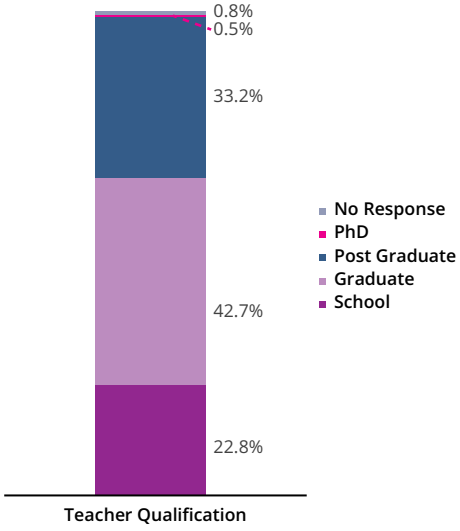
Consequently, although high maturity tech adoption that includes using tech for all 3 areas – admin, database management, and core education delivery has been low, the adoption overall is still high with most colleges and institutes using some form of tool in order to stay relevant and ensure business continuity.

It is important to note that as schools slowly start to open, they must sustain the technology adoption and further keep on upgrading their technology readiness in order to stay relevant and raise the bar in terms of quality of education delivery and efficiency.

2. Create teacher centric products

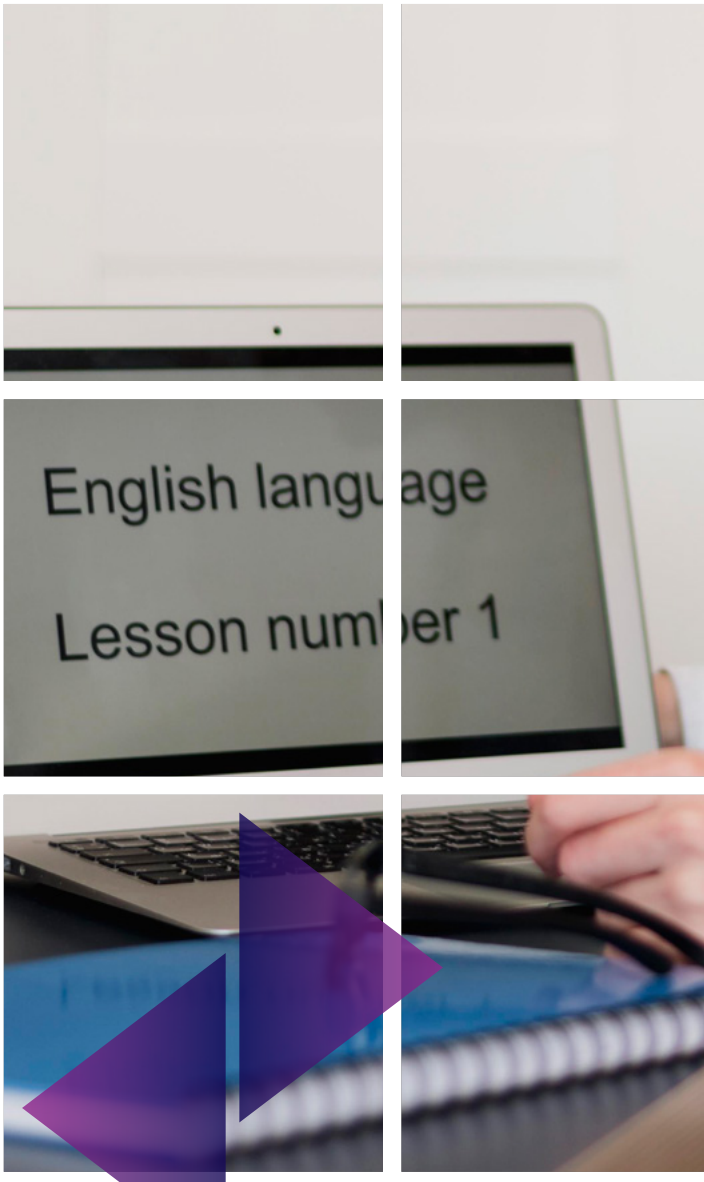
As technology takes a centre stage in education and becomes mainstream – it is set to play a critical role in democratising access to quality education for all. However, success also hinges on its ability to create successful learning outcomes for all.

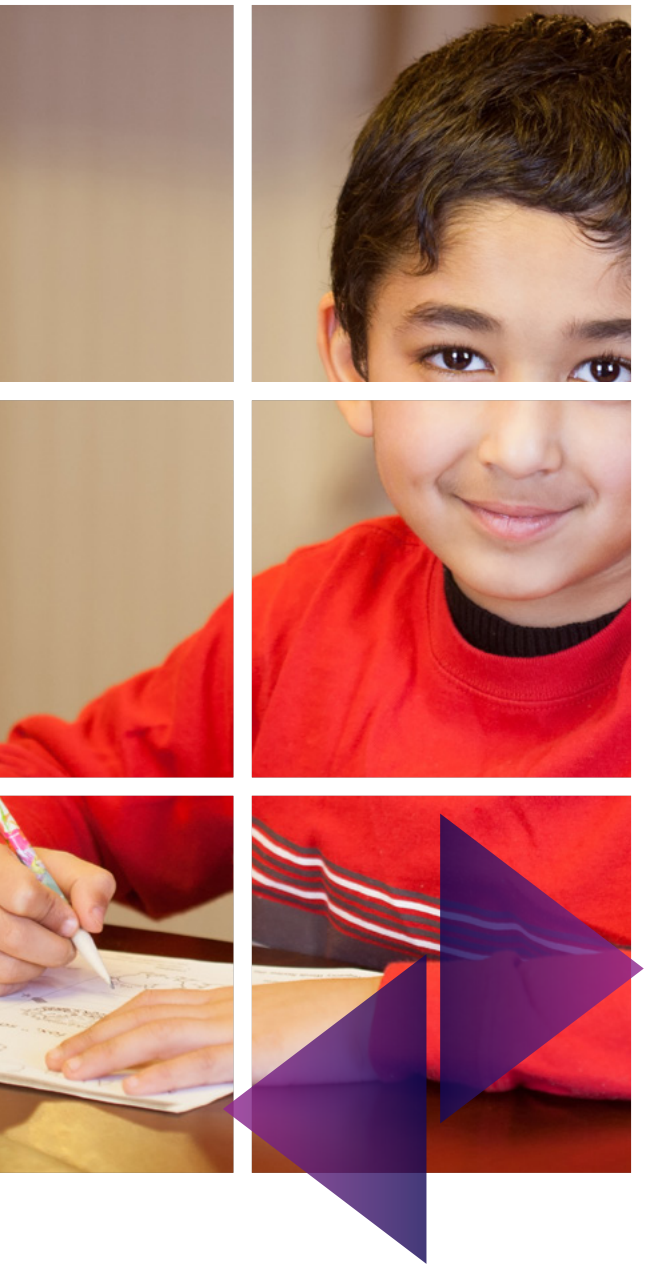
Qualification of Teachers in K12



Source: DISE

Considering that ~22% teachers still don't have a graduate degree, technology adoption needs to be approached from both (a) solving device access/ affordability and (b) teacher readiness. In order to create impact at scale and deliver learning outcomes, teacher centric products that empowers them to deliver better will be key going forward.





3. Provide regional language and multi-device support

Large part of the Indian population, although not native English speakers, have aspirations for their children to become proficient in the language. However, children, whether they study in English medium schools or not, are more comfortable communicating in their mother tongue or local language. Additionally, large swathes of this demographic still access the internet through smartphones only.

Institutes, policy makers, and technology providers must collaborate to innovate for children from mobile-first segments and tailor content and delivery in multiple languages to ensure its relevance and potential for impact.

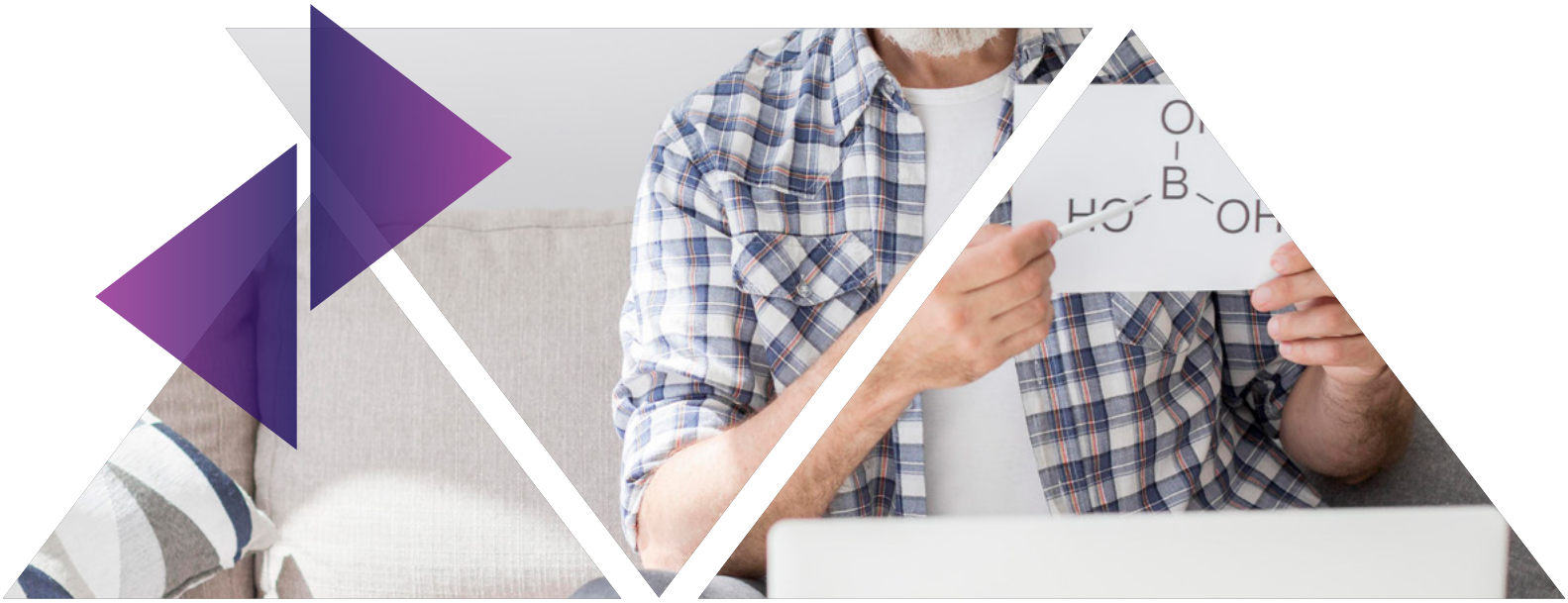
4. Focus on delivering learning outcomes

Going forward, it will also become important to highlight student outcomes that can be attributed to use on online education. These outcomes can include school grades, ranks in competitive exams, proficiency in languages or other subjects, or building of technology, cognitive skills. Online education, by virtue of tech, has also the ability to collect performance and progress data at scale. Leveraging the data, technology can support students on their learning path and show individual student progress at a higher frequency to the parents.

5. Device & Digital Content

Given that delivering online education hinges on access to devices and digital content, all key stakeholders must prioritise in order to increase access and affordability for all.

As students often share devices with their parents, it is imperative that access to devices and digital content does not become a bottleneck. Solving for the two is critical in unlocking the democratisation of education through technology.



6. Cloud Infrastructure

Cloud based infrastructure is a key requirement to enable delivery of online education while solving for content digitisation, storage, data security and delivery at scale. Cloud players led by AWS, Google and Microsoft have played a critical role in enabling the technology solutions solving for specific education needs. As technology in education institutes becomes mainstream, institutes and technology must work closely to unlock the power of the cloud and deliver technologically secure, and efficient solutions at scale.

Role of cloud in Education delivery

Students and Education institute's expectations from Technology Players	How cloud-based players are supporting on the requirement
Seamless connectivity for live and recorded lectures	• Make multiple copies of the lecture across multiple servers for quick access of content for the students • Adjust video resolution keeping in mind the students network strength and offer the video at resolution best suited for the student
Students to be able to access the content any time and many times	• Dedicate multiple servers for the content online. Even if a server goes down there are other servers to take the load
Should be able to handle fluctuations in the load	• Dedicate enough server space so that any spike in load can be handled • Offer dynamic server space to keep the demand fluctuations in control
Offer data security	• Ensure the data is not shared with advertisers for any direct/indirect marketing • Offer a similar level of security which is offered to military services or global bank • Setup servers in India

7. Skill Upgradation

Given the importance of technological readiness for the education landscape in India, policy makers and institutes must prioritise skills upgradation at teacher level to truly unlock the potential of technology in education.

The establishment of National Professional Standards for Teachers (NPST) under NEP is a much-needed intervention that will likely raise the bar and quality of teachers, nationwide.

Technology has the potential to provide personalized learning paths and instant feedback on student performance. Teachers play a critical role, especially in providing high-order feedback and, more importantly, in being the adult who has the power to motivate, instil a love for learning, and offer a sense of caring that is generally missing in automation.

Technology Adoption in Institutes

Theme 1

NEP 2020 marks a landmark shift in education policy – sets the stage for digital transformation of education in India

With an aim to create a more inclusive, cohesive, and productive nation, the recently unveiled National Education Policy 2020 (NEP) has come as a ground-breaking reform by the Ministry of Human Resource Development (MHRD). Under the NEP 2020, the focus areas of the reforms seek to cultivate '21st-century skills' among students, including critical thinking, problem-solving, creativity and digital literacy.

The policy has a balanced and inclusive outlook, with a diminished line of difference between arts and STEM courses, in addition to blended, multi-disciplinary learning. It recognises the need to bridge the gap in education through technology and digitisation.

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> *"NEP marks a landmark shift for higher education. Allowing multiple entry/ exit points and inter-disciplinary offerings will help in democratising access and push enrolment rates. The emphasis on technology will further push the accelerated growth of the sector. "*
>
> ***- Higher Education Provider***

Critical thinking, problem-solving, creativity and digital literacy.

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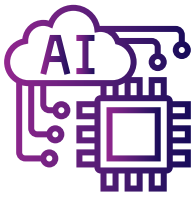
The Policy is pioneering as it notes the need to generate awareness as well as conduct research on various aspects of the emerging disruptive technologies.

Digital India

The Policy calls for investment in digital infrastructure, development of online teaching platforms and tools, creation of virtual labs and digital repositories, training teachers to become high quality online content creators, designing and implementing of online assessments, establishing standards for content, technology and pedagogy for online teaching-learning. The Policy envisages the creation of a dedicated unit for the purpose of devising the development of digital infrastructure, digital content, and capacity building to supervise the e-education needs of both school and higher education.



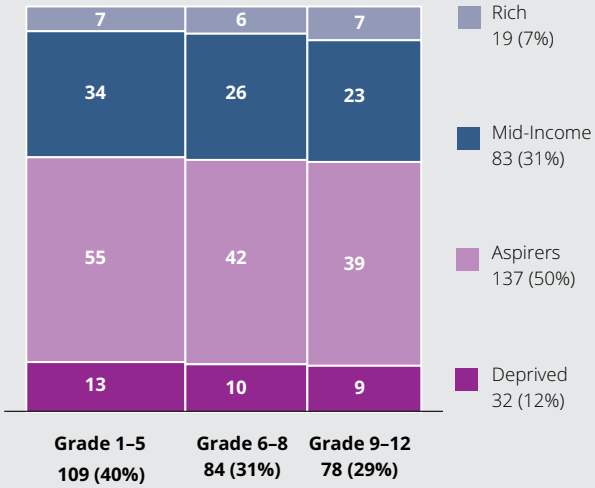
Adapting to AI

The Policy recognises challenges arising on account of the widespread use of Artificial Intelligence ("AI") and highlights the need to adopt changes occurring on account of increased use of AI across sectors. It has tasked the NETF with identifying and categorising emergent technologies based on their 'potential' and 'estimated timeframe for disruption' and to present a periodic analysis of the same to the MHRD, who shall then formally identify such technologies which require appropriate responses from the education system. In light of the emerging 'disruptive technologies', the Policy is pioneering as it notes the need to generate awareness as well as conduct research on various aspects of the emerging disruptive technologies, including concerns pertaining to data handling and protection.

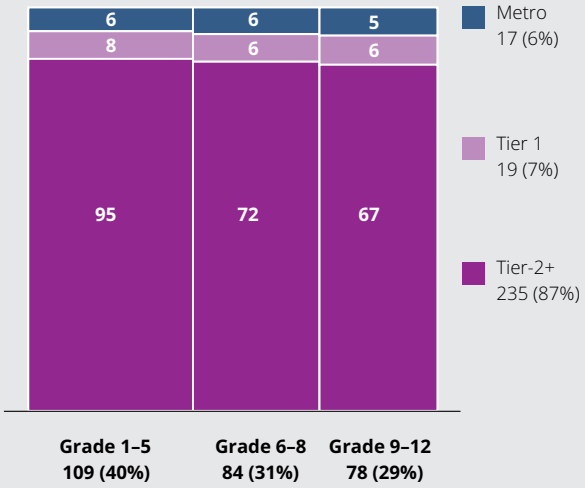
Key reforms for the K12 education

Overall Student Population

By Grade and Income Level
Million Students, 2019
N=271



By Grade and City Tier
Million Students, 2019
N=271



Source: NSSO, DISE, RedSeer Analysis.

One of the highlights of the NEP has been the proposal to integrate vocational education in middle and secondary schools. The policy also proposes to establish skill labs in collaboration with local polytechnics, where courses will be imparted in online mode.

NEP dismantles the rigid distinction between arts, commerce, and science. Thanks to the policy, the choice of taking up history with chemistry will now be possible for students. This brings in the much-needed fluidity for students to hone their skills and cognitive abilities.

The Policy recognises the importance of technology in aiding teachers, bridging the language barrier between teachers and students, creating digital libraries, popularising language learning as well as ensuring greater access to education (specifically for differently abled children). It is also proposed that coding be introduced in school curriculums as an important skill that students must develop. The Policy also notes that technology can be an effective tool in facilitating teacher education and encourages the utilisation of technology platforms for online teacher-training.

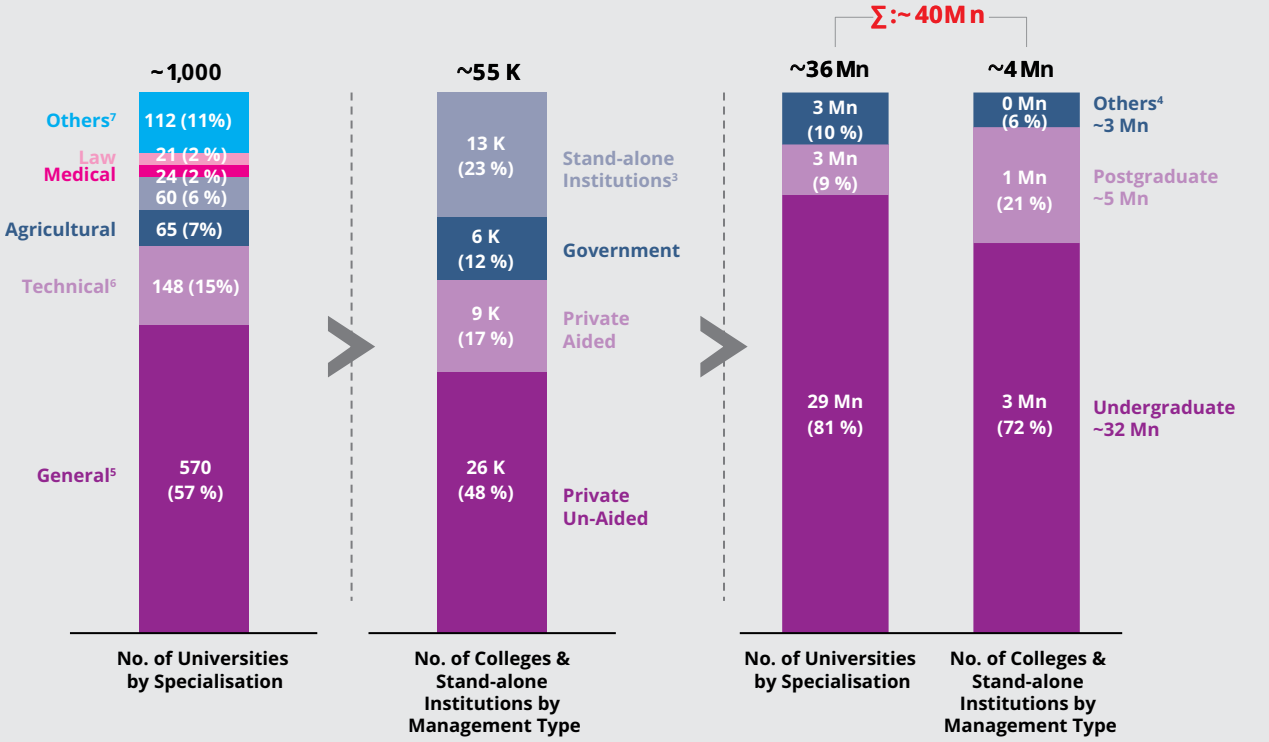
> *"NEP 2020 is a very welcome move. The emphasis on holistic development, learning outcomes stands out in the policy. I am very hopeful this will raise the bar for education providers as well and we will see long term impacts on the ground."*
>
> ***- NGO owner running network of schools in Uttar Pradesh***

Key reforms for Higher Education

Higher Education in Numbers

~40 Mn students served by ~55K colleges and stand-alone institutions

No. of Universities[1], Colleges[2] and Student Enrolments in Higher Education
Numbers, FY20E



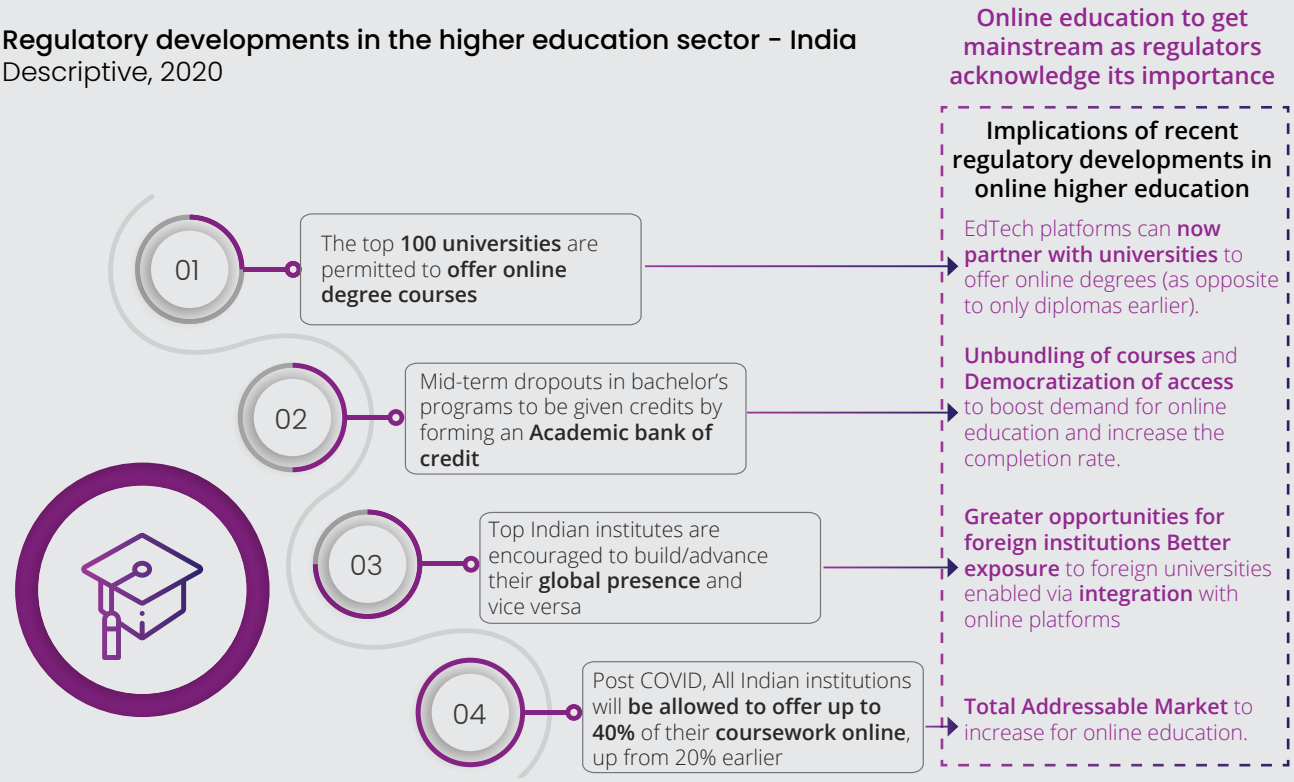
Notes:
1. **University and University Level Institutions** i.e. the institutions which are empowered to award degree under some Act of Parliament or State Legislature.
2. **Colleges/Institutions** which are not empowered to provide degree in its own name and therefore are affiliated/recognized with Universities.
3. **Stand-alone Institutions** (not affiliated with Universities) which are not empowered to provide degree and therefore run Diploma Level Programs. During the survey, following 7 types of such Institutions have been covered.
4. **Others:** include Diploma (teacher training, nursing and technical streams.), PG Diploma, Integrated PHD, Certificate, Ph.D, M.Phil, etc.
5. **General:** Arts, Commerce, etc.
6. **Technical** includes engineering institutes and polytechnics recognized by AICTE/State Directorate of Technical Education.
7. **Others** include Sanskrit, Science, Fine Arts and Languages

The need to embrace technology in professional education (legal/health) as well as the incorporation of technology to expedite the aim of achieving 100% literacy (by introducing quality technology-based options for adult learning) has also been put forward.

The Policy recognises the importance of technology in addressing various societal challenges and seeks to promote interdisciplinary research and innovation. For instance, Higher Education Institutions ("HEIs") have been encouraged to set up start-up incubation centres and technology development centres, and a National Research Foundation is also proposed to be set up to cultivate a culture of research. The Policy envisages the establishment of the National Educational Technology Forum ("NETF"), which shall operate as a platform for free exchange of ideas on the use of technology to enhance learning, assessment planning and administration for school and higher education.

Recent regulatory developments marks a major shift in higher education and will enable accelerated growth in Indian online higher education

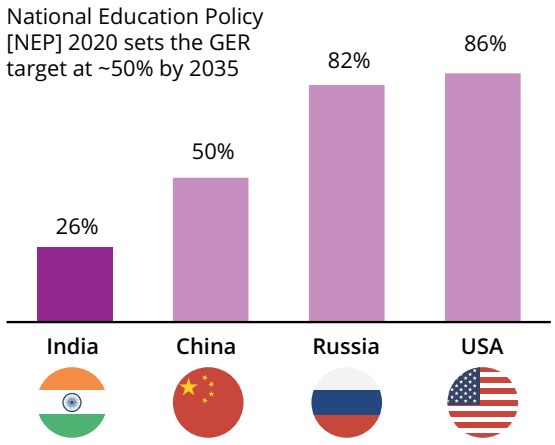
Regulatory developments in the higher education sector - India
Descriptive, 2020



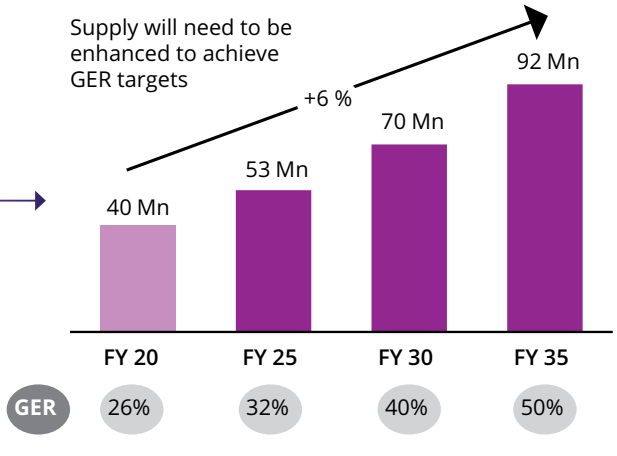
The emphasis on multi-disciplinarity and flexibility for the holistic development of learners in higher education institutions (HEIs) is evident from the proposed reforms. From setting up a regulatory body for digital infrastructure development (Higher Education Commission of India) to the creation of an Academic Bank of Credits, technology is at the core of the national policy.

Higher education enrolments is expected to grow at 6% CAGR as implied by government targets

Gross Enrolment Ratio (GER)[1] – by Country
GER %, FY 2020



Expected Growth in Student Enrolment in Higher Education
no. of students, Mn, FY 20 – FY 35E

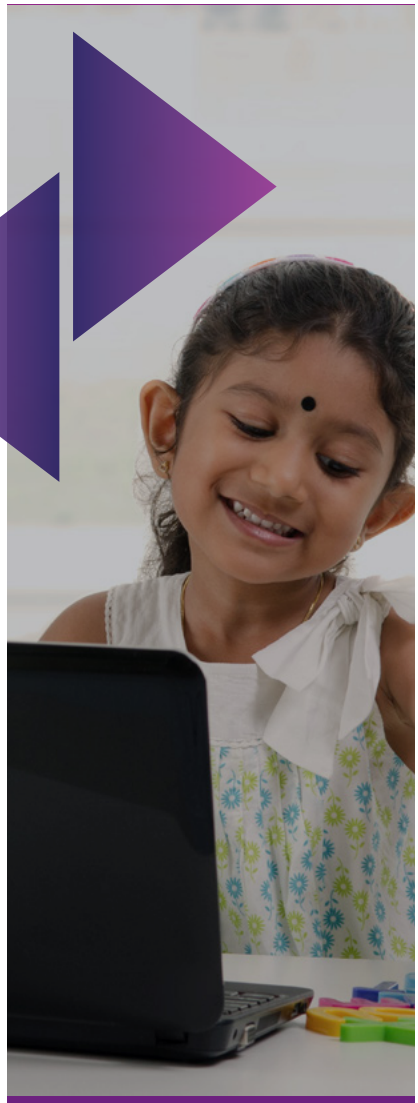


Theme 2

State of Technology Adoption by Education Institutes – COVID Impact on Education – Digital Learning 'the new norm' for the Indian students!

COVID Impact on Education – Digital Learning 'the new norm' for the Indian students!

Covid 19 severely disrupted the education deliver landscape in India. As schools and colleges remain shut – online education has taken a centre stage in the delivery of education in India.



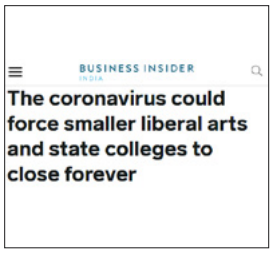
COVID-19 has hit India hard with all offline operations of educational institutes and private tutoring coming to a grinding halt

Education in the news


BL

News

COVID-19: Civil services aspirants hit as coaching institutes shut down ahead of exam

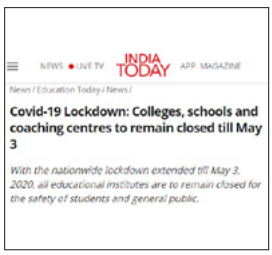

BUSINESS INSIDER INDIA

The coronavirus could force smaller liberal arts and state colleges to close forever


ThePrint

In India, over 32 crore students hit by Covid-19 as schools and colleges are shut: UNESCO

More than 157 crore students across 191 countries severely impacted by closure of educational institutions due to coronavirus, says UNESCO report.


INDIA TODAY

Covid-19 Lockdown: Colleges, schools and coaching centres to remain closed till May 3

With the nationwide lockdown extended till May 3, 2020, all educational institutes are to remain closed for the safety of students and general public.

Voice of Students and Parents

"The schools do not have technology infrastructure to deliver remote tutoring."

"Coaching centres are shut and exams are in the next month."

"Besides electronic communication & presentations, there isn't much tech readiness."

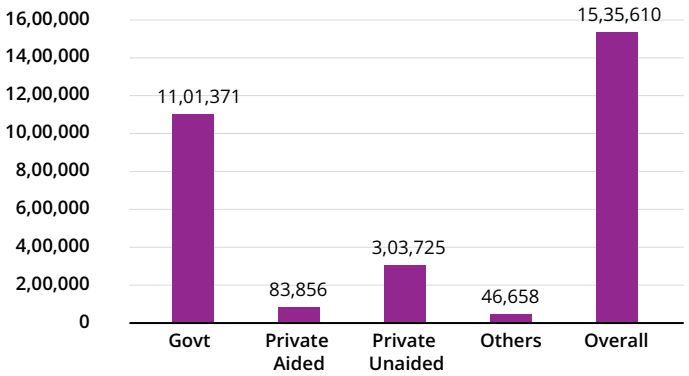
online education has taken a centre stage in the delivery of education in India.

> *"There are about 1.5 Mn schools in India. Technology infrastructure has been lagging in Indian schools. Only about 15-20% of the schools had a working computer before Covid hit. And only about 10% of those have adopted more mature technology products such as smartboards, and other teacher and admin support solutions."*
>
> ***- Education Sector Policy Expert***

Technology adoption of institutes

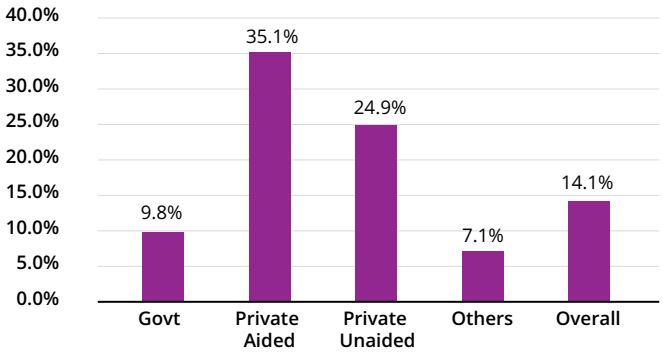
Covid 19 – COVID disrupted the education industry and exposed the weak tech readiness among schools in India - DISE nationwide survey of 1.5 million schools (K12 nearly the total universe) suggests that only about 14% of the schools had working computers in Academic Year 2017, whereas in case of higher education, about ~85% of the 55K colleges had working computer facilities.

Overall Schools



Source: DISE, RedSeer Analysis

% schools with computers in working condition



Source: DISE, RedSeer Analysis

> *"Access to device is a big bottleneck in administering live tuitions. Students share device with their parents and therefore administering it live is a challenge as the spare device is not always available."*
>
> ***- Affordable Private School Owner – Karnataka***

Our research on 300+ schools and colleges validate these findings. ~2/5 of the schools in K12 had working computer and internet infrastructure whereas ~4/5 in colleges had the necessary tech infrastructure.

Despite low readiness, both schools and colleges showed agility in responding to the lockdowns and adopting various technologies to ensure that teaching continuity is maintained. While more mature schools and colleges, particularly serving to mid-high income segments – moved to live online classes, the masses found saviour in WhatsApp as a tech-based communication medium.

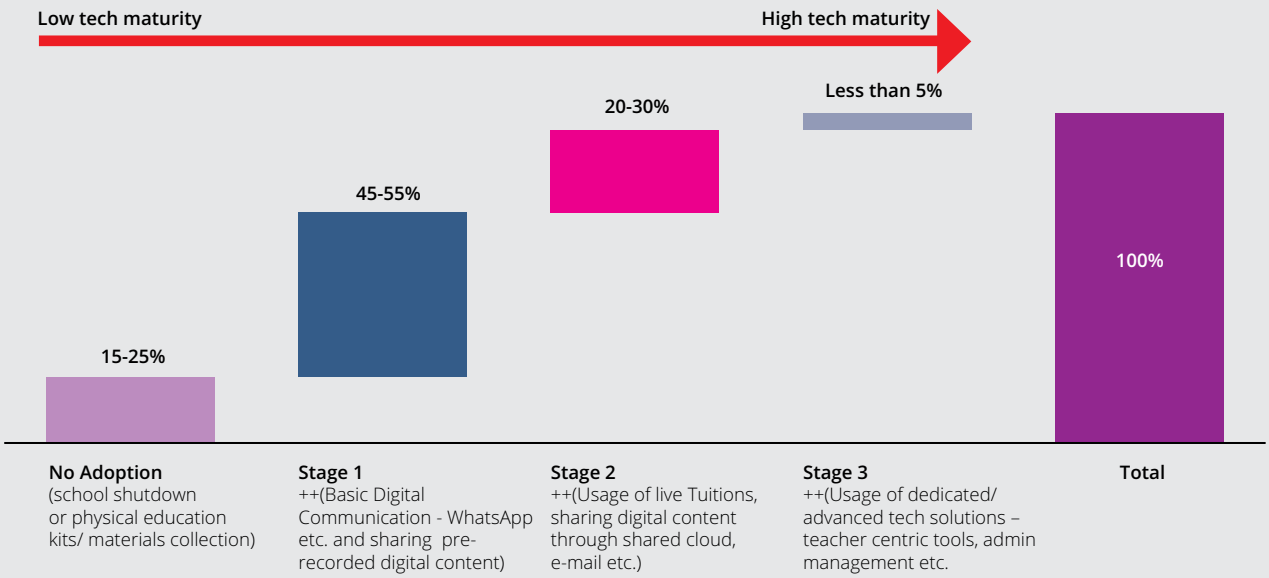
While most college going students have a basic understanding of technology and possess laptops (~40%+), smartphones (95%+), students in K12 significantly lag on device ownership. Most students in K12 share devices with parents and therefore adjusting to online classes has been not as seamless as their college going elders.

Furthermore, teacher readiness is another bottleneck that has limited the tech adoption and delivery. Comfort with technology and teacher readiness are cited as the key challenge in scaling technology adoption amidst lockdown by 3 in 5 institutes surveyed.

Consequently, although high maturity tech adoption that includes using tech for all 3 areas – admin, database management, and core education delivery has been low, the adoption overall is still high with most colleges and institutes using some form of tool in order to stay relevant and ensure business continuity.

In schools – live tuitions adoption has been particularly low among grades 8 and below (sub 10%) – partly due to restrictions/ advisory issued against live classes by several state governments.

Level of technology adoption among education institutes (K12) after Covid

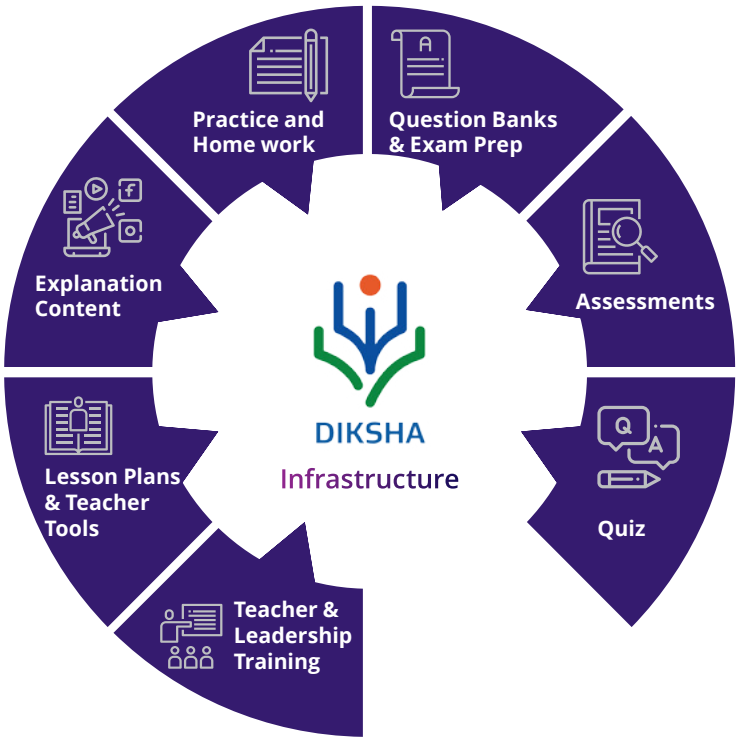


Source: Expert Interaction(N =70), RedSeer Analysis

Government initiatives to promote digital learning

DIKSHA is the national platform for school education available for all states and the central government for grades 1 to 12 and was launched in September 2017. DIKSHA can be accessed through a web-portal and mobile application. DIKSHA provides access to a large number of curricula linked e-content through several use cases and solutions such as QR coded Energized Textbooks (ETBs), courses for teachers, quizzes, and others. As of July 2020, it is estimated that over 60 crore ETBs are being printed this year in India by 35 states and Union Territories, with more than 30 crore content plays and 200 crore page hits already on DIKSHA.

One Diksha, multiple central and state solutions and programmes

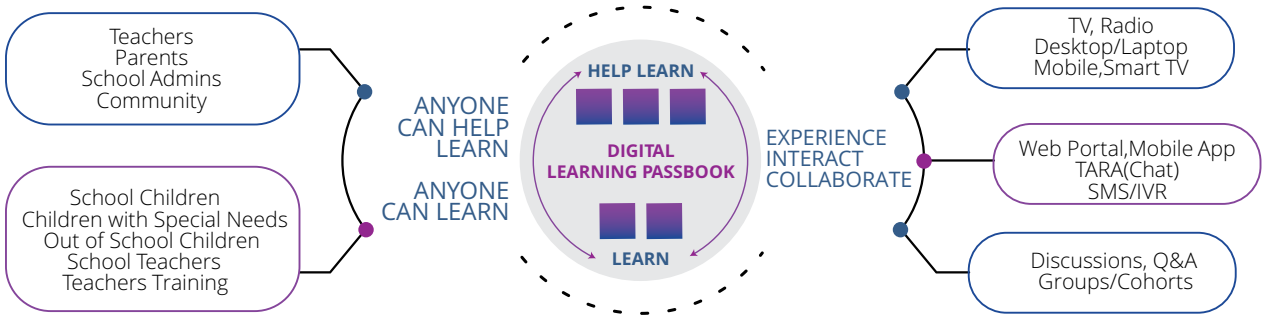


Source: India Report Digital Education (June 2020), Ministry of Human Resource Development

> *"Governments have created great tailwinds for digital in Education. Content digitisation, e-books are now available for both K12 and higher education through Diksha and Swayam portals."*
>
> ***- NGO running colleges and schools – Madhya Pradesh***

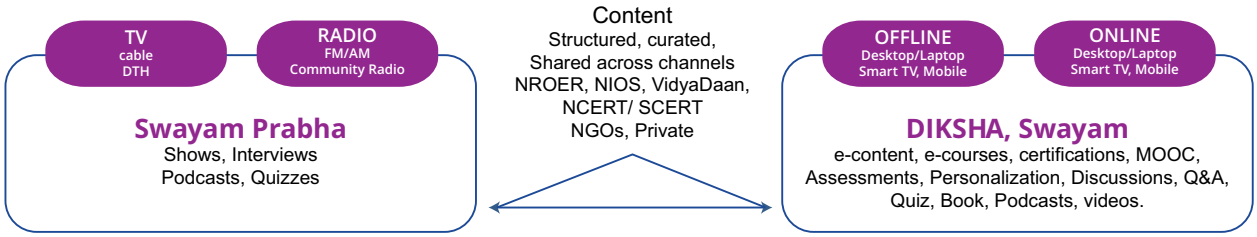
Government initiatives to promote digital learning

UNIFIED AND RESILIENT APPROACH FOR PM eVIDYA



ENABLING COHERENT MULTI CHANNEL, MULTIMODAL, LEARNING CONTINUUM

AT SCHOOL, AFTER SCHOOL, AT COMMUNITY CENTRE, AT HOME
SYNCHRONOUS, ASYNCHRONOUS, OFFLINE, ONLINE,
PHYSICAL/ DIGITAL, SELF-SERVICE/ ASSISTED



HW/SW INFRA: Smartboards, Tablets, Live Conferencing, Hosting Infra, SMS, Email, Digilocker, JAM
CONNECTIVITY: Satellite, TV, DTH, Cable, Bharat Net, WiFi, Mobile Network

Source: India Report Digital Education (June 2020), Ministry of Human Resource Development

Institute Personas – Tech Journey: Adoption and Challenges

Type of School/ TG/ Student Demographic	Govt/ Affordable Private School	Private School (Mid –Premium)	Tier 3+ College	Tier 1/ 2 College
	Grade 1 to 12	Grade 1 to 12	Higher Education	
Tech Readiness before Lockdown	• No/ minimal working computers in schools • No use of mature tech products e.g. smartboards, teacher support tools	• Working computers installed in schools • A small proportion ~10% use mature tech products on top	• Working computers installed in ~80%+ colleges	• Working computers installed in ~95%+ colleges • ~70%+ colleges use Bio-metric and other tech for admin support
Tech adoption after Covid – **Content Sharing**	• Sharing pre-recorded content via WhatsApp • Physical kits collection (weekly) • Usage off Diksha/ other YouTube links	• Sharing content via e-mail and WhatsApp • Content digitisation and sharing though Google Drive/ One Drive (premium schools) • Physical kits collection in lower city tiers	• Sharing content via emails and shared drive	• Sharing content via emails and shared drive
Tech adoption after Covid – **Live Tuitions**	• No live tuitions (Grade 1 to 8) • Live tuitions (only for specific subjects: Grade 9 to 12) ~1-2 times a week	• Live tuitions – for premium schools (limited 1-4 hrs/ day) – varies by grade level	• Live tuitions (~70-80%+) • Most teachers take lectures from campus	• Live tuitions (~95%+)
Key Challenges with Tech Adoption	• Teacher readiness/ Tech literacy • Smartphone access (shared with Parent)	• Teacher readiness/ Tech literacy • Availability of laptop (shared with Parent)	• Teacher readiness/ Tech literacy • Internet infra in remote areas • Tests, assignments	• Internet infra in remote areas

"While uploading assignments online, we face a lot of issues, as sometime the picture quality is not that great or blur, and teacher asks them to resend the assignment. We are not used to this."

- Parent of Child in Grade 6
Small electric store owner, Gujarat

"I have not worked on Microsoft Word and PowerPoint before. I am familiar with smartphones but using PC is still new for me. It gets complicated to convert files into to PDFs, uploading them create forms etc"

- Grade 10 Geography Teacher,
State Board (Bihar)

Technology adoption by Students

Technology Adoption

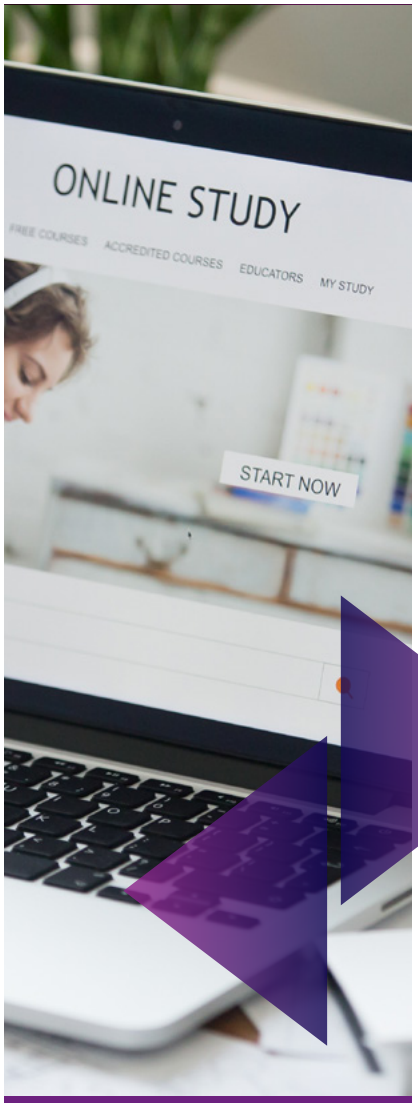
One of the critical questions to students and parents when we connected with them was to understand the adoption of technology in connecting with the teachers and across platforms it was observed that this adoption has increased significantly

Live Lectures

With the onset of COVID-19 and nation going into lockdown; technology came as a big enabler to connect students and teacher live to conduct classes and solve any doubt real time. A massive jump was observed in this technology adoption for the students and parents interviewed

Schools:

- **~75% of the school students mentioned** that they are making use of live lectures to connect with the teachers which used to be under 10% before the lockdown was announced, reflecting ~8X jump
- As expected, private schools performed above average with 90%+ students and parents making use of technology to join live classes, while for govt schools this adoption was close to 60%
- Not a significant difference was observed when the same analysis was performed for Metro & Tier 1 cities Vs Tier 2 and smaller cities. The difference in adoption was within 15% range with Metro and Tier1 cities leading

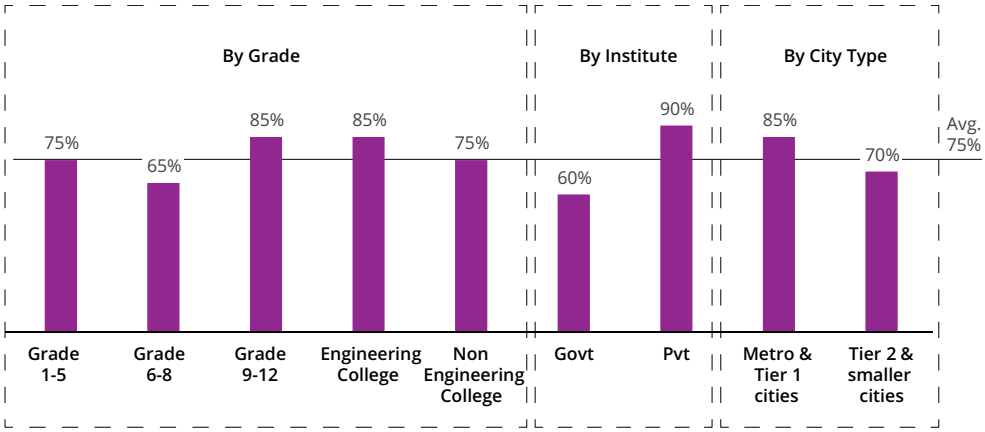


~75% of the school students mentioned that they are making use of live lectures

Colleges:

- **~80%+ of the college students** mentioned that they are making use of live lectures to connect with the teachers which earlier would be close to 30% before the lockdown, reflecting ~2.5X jump
- Engineering colleges due to the presence of computer labs and trained computer science and IT faculty were able to adopt early to the technology requirements. However non engineering colleges were able to catch up fast with marginally leading behind the engineering colleges.
- Not a significant difference was observed when the same analysis was performed for Metro & Tier 1 cities Vs Tier 2 and smaller cities. The difference in adoption was within 15% range with Metro and Tier1 cities leading

Tech adoption for Change to Live Classes (%)
N=316

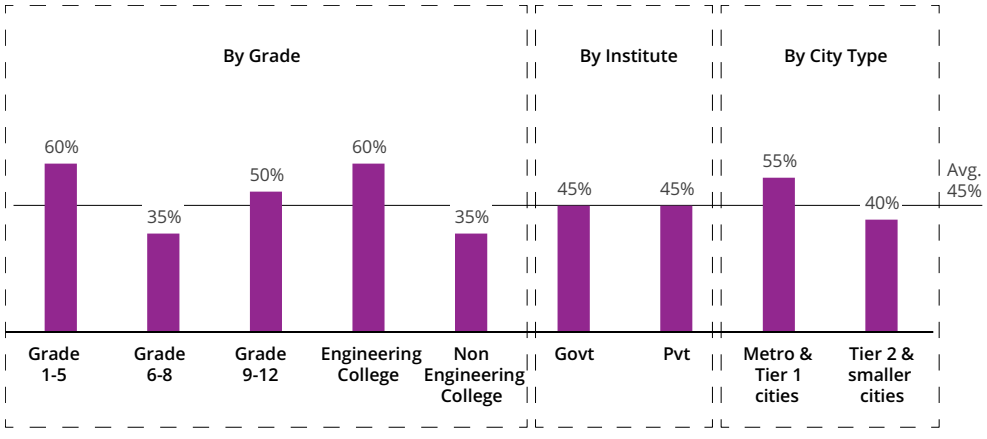


Recorded Lectures:

A lot of students are facing an issue of access to technology devices to join live classes. This was because the devices are shared among the family members. Students' access to live lectures cannot be guaranteed due to this challenge. This challenge is amplified due to **unstable internet connection**. To overcome this challenge teachers and institutes recorded the lectures and shared with the students, which they can go through at the time of their convenience and share back any questions they have for the faculty.

Adoption of this feature displayed a trend which is similar to seen in the case of live classes, however, rise in adoption was ~50%, a 15-20% points rise over the pre lockdown level.

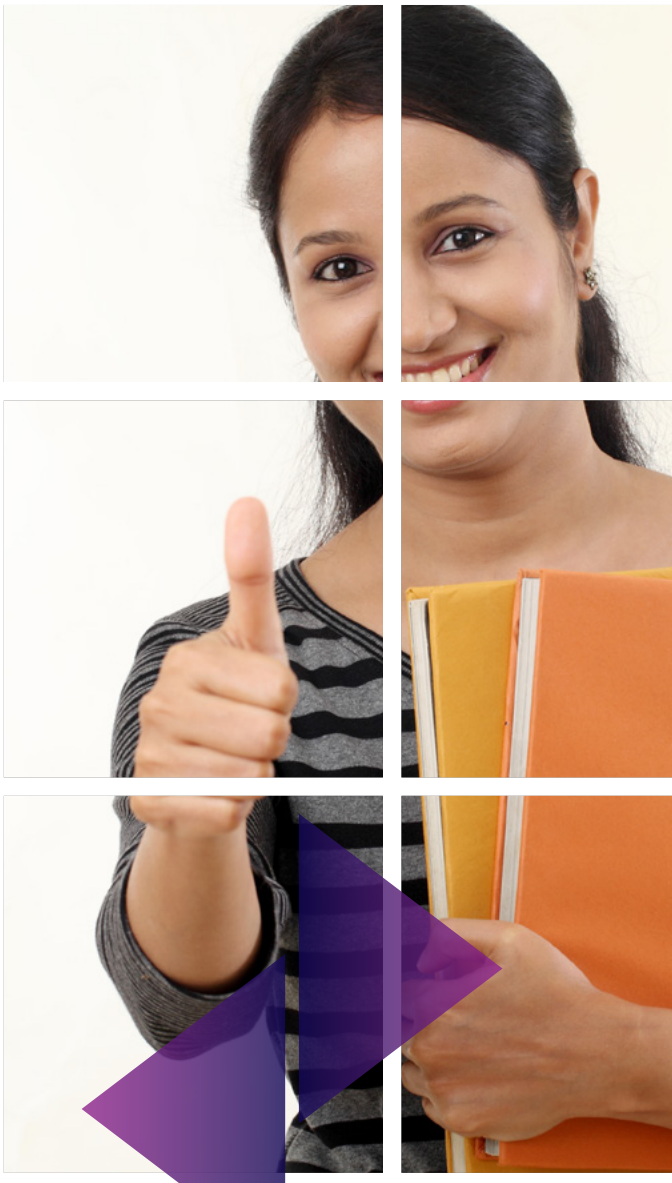
Tech adoption for Recorded Lectures (%)
N=316



Technology adoption by Tuition:

Tuitions saw a smaller jump in tech adoption post lockdown to ~15% in cases of both live and recorded lectures.

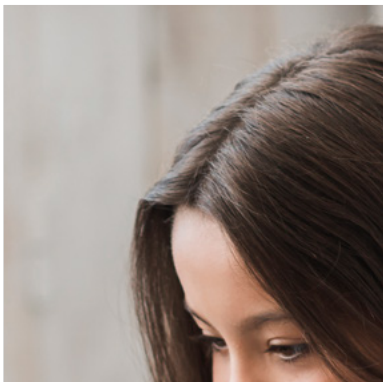
- The adoption of technology in live lectures for tuitions was almost nil pre lockdown, however tuitions also adapted to changing requirements and ~15% of the students interviewed are making use of live lectures to study
- Tuition centres already had some technology in place to record lectures and share with students even before lockdown and hence not a significant jump in this case was observed
- Since students are already spending a lot of time on screen for school classes and have limited access to technology device, the rise in adoption of technology to take classes from tuitions was seen only in critical cases such as board exams or other competitive exams



Making use of online content:

Students extensively made use of both free and paid content available online to continue the classes.

- Youtube, Khan Academy, Byju's, Vedantu, Toppr, Unacademy, upGrad, Coursera were some of the key platforms identified by students to refer to the online content
- In case of both free and paid content the adoption rose to ~45%. There was a much bigger leap of ~2X was observed in case of free content available, however for the paid content there was a marginal rise
- The biggest leap for search for online content was observed in the case of students in 1-5 grade. As a higher level of creativity is required in this age group to keep students interested and occupied



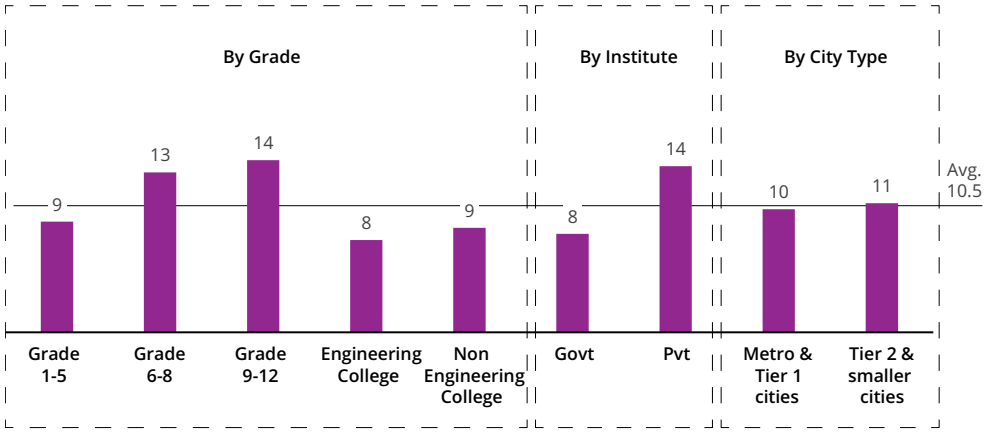
Screen Time:

To join the classes, it was observed that students were **spending 10+ hours per week on screen** attending lectures (live or recorded), translating to ~3 lectures of 40 min each per day.

While analysing this data for different data cuts, it was observed that students in Grade 6-8 and Grade 9-12 with private school backgrounds are spending the highest time on screen which is **~50% higher compared to average**.

When asked how likely are you to continue education once schools open, students gave a positive response in favour of technology adoption, however average screen time dropped to ~5 hours per week.

Average Screen Time – Hours/week
N=316

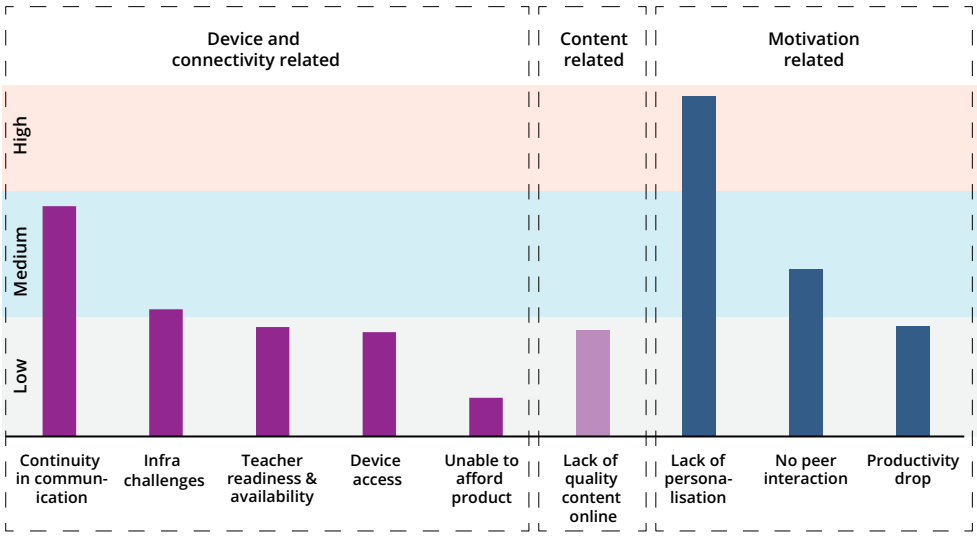


Challenges in the current ecosystem:

When we tried to understand the challenges faced by students in taking the classes online, they could be classified along the following buckets

- **Device and connectivity related**
  - » Assess to device is questionable as members within family share device and students do not have access to device at all/any time
  - » Even though a lot of tech players made its platform free for access to institutes, only those institutes were able to take real benefit which had institute email ids.
- **Content related**
  - » This is due to poor audio or video quality or unorganized style of presentation.
  - » The smartphones used also had space constraints. Students had to delete old lectures to access the new lectures and hence taking reference from past lectures was a challenge
- **Motivation related**
  - » Students identify the missing personal touch between student and teacher as the biggest hurdle in online education. Teachers also identified that it is difficult to control the environment of the class online. If a student is distracted in a class, it is difficult for teacher to identify the same and hence there is a higher onus on student to ensure that learning is made
  - » Increased screen time and limited social life has resulted in a lot of mental stress for the students, impacting there learning ability
  - » A lot of students and teachers mentioned that the learning happens when students discuss among group and solve each other's doubts. In the current scenario this is limited or missing

Challenges faced by students in taking classes online (relative view)
N=316



Note: Longer the bar, bigger is the challenge

Tech Satisfaction and Future Outlook:

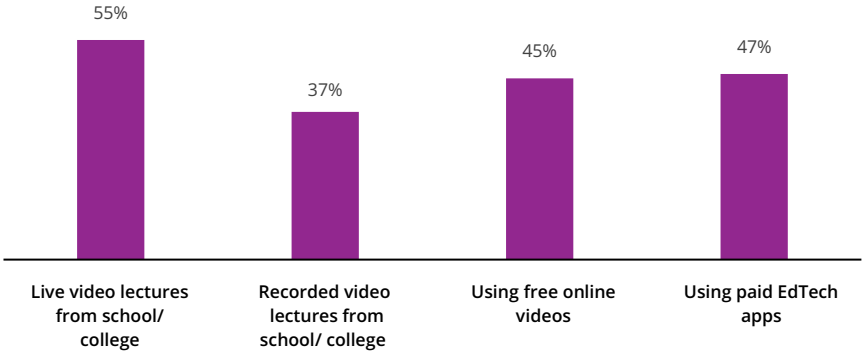
When asked how likely are you to continue using the tech platforms post pandemic is over, students and parents showed an positive interest in tech adoption with **~90% of respondents saying that they will continue to use these technology platforms to learn**, however time spent online would reduce to ~5 hrs per week from current ~10 hrs.

Students mentioned there should always a provision to attend classes in case they could not visit institutes

Our interviews with education experts validated that tech will play a critical role in implementing the new education policy. **The flexibility offered to mix and match the courses and joining school after break can only be implemented by technology**

Some of the experts also mentioned that tech adoption will also help reduce school and college dropout specially in the case of **girl students as they can attend classes even from home at the time of preference.**

How likely would you recommend following technology channels/platforms – NPS (%)
N=316



Note: NPS refers to %Promoters-%Detractors

Student Personas – Tech Journey: Adoption and Challenges

Type of School/ TG/ Student Demographic	Low – Mid Income		Mid – High Income		Low Income/ Tier 2, 3+	Premium College
	Grade 1 – 8	Grade 9 – 12	Grade 1 – 8	Grade 9 – 12	Higher Education	
Tech usage before Lockdown	• Family has ~1.5 smartphones per household • Shared access to smartphone		• Family has 2+ smartphones • ~2 in 5 kids have a smartphone (Grade 9 – 12) • Access to shared laptop/ Tablet		• Owns smartphone • Access to PC/ laptop (own/ shared)	• Owns smartphone • Access to PC/ Laptop (usually owned)
Tech usage after Covid	• Increased smartphone use • Usage off Diksha/ other YouTube links		• Increased smartphone use • Increased use of laptop/ tablet (often shared) • Use of EdTech apps		• Use of devices • Use of EdTech	• Use of devices • Use of EdTech • Online group studies
Key Challenges with Tech Adoption	• Limited window for device access		• Personalisation		• Access to Laptop • Internet infra in remote areas • Group connects	• Personal Feedback • Internet Infra in remote areas

"My daughter share the smartphone and laptop with us. Live classes were manageable when we were at home as I used to manage my screen time around the my daughter's class schedule. But now that I have started going to work, the time is very difficult to sync. It is a common issue for many parents in the class."

- Parent of Child in Grade 9,
Private Bank Employee, Kerala

"Our college swiftly moved classes online. Our college anyway used to share presentations and content online, and we all have registered email ids provided by institute. The major problem with live classes is that that internet bandwidth in my hometown is not so good. For that reason, I have to often rely on pre-recorded content which I download and watch later."

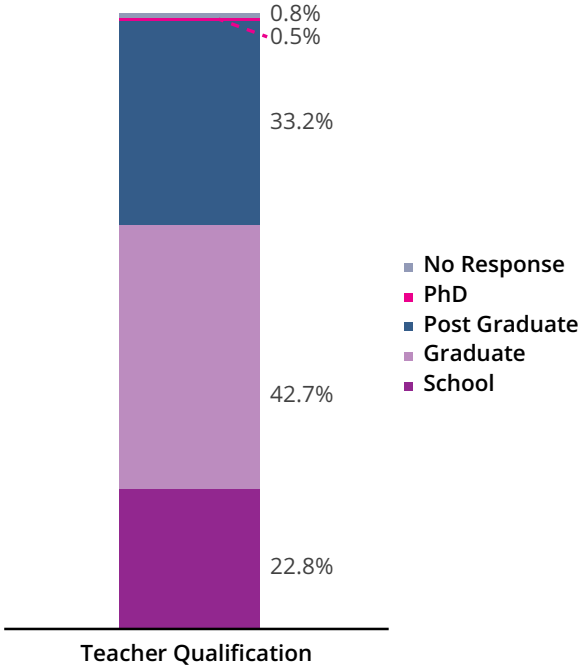
- Tier 1 engineering college student,
Himachal Pradesh

Theme 3

Recommendations: The way forward for institutes and technology providers

As technology takes a centre stage in education and becomes mainstream – it is set to play a critical role in democratising access to quality education for all. However, success also hinges on its ability to create successful learning outcomes for all.

As only about 15-20% of the schools have required infrastructure in place (% of schools in K12 with a working computer), and considering ~22% teachers still don't have a graduate degree, technology adoption needs to be approached from both (a) solving device access/ affordability and (b) teacher readiness. In order to create impact at scale and deliver learning outcomes, teacher centric products that empowers them to deliver better will be key going forward.



~22% teachers still don't have a graduate degree

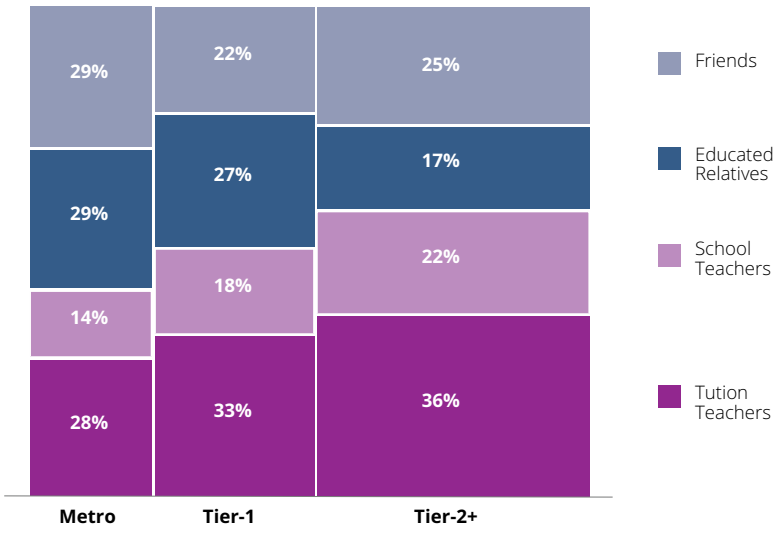
NEP is a great positive step in this direction, as it emphasises on creating literacy at not just reading, writing but also measuring numerical literacy, reading comprehensive literacy etc. and measuring progress of children on a holistic 360-degree basis.

The establishment of National Professional Standards for Teachers (NPST) under NEP is a much-needed intervention that will likely raise the bar and quality of teachers at nationwide level.

Technology has the potential to provide personalized learning paths and instant feedback on student performance. Teachers play a critical role, especially in providing high-order feedback and, more importantly, in being the adult who has the power to motivate, instil a love for learning, and offer a sense of caring that is generally missing in automation.

Teachers also play a role of key influencers:

The role of school and tuition teachers as promoters and influencers to buy EdTech increases from metro to tier 1 to tier 2 cities. Entrepreneurs should actively think about how to leverage these stakeholders as important promoters.



Source: Customer Interviews (N = 1883), RedSeer Analysis.
Note: According to our IDI's, teachers influance was coming high in Tier-2 and Tier-3 cities

Offering regional language content:

Large part of the Indian population, although not native English speakers, have aspirations for their children to become proficient in the language. However, children, whether they study in English medium schools or not, are more comfortable communicating in their mother tongue or local language. Thus, there is a gap between the ability to communicate in English and being at ease with it. Tailoring technology to meet their needs requires understanding such nuances involved in language use. As evident on some of India's biggest content platforms, the active users are largely from non metros and prefer vernacular content. Given the vernacular usage in India, online education will benefit from offering vernacular options in education products while catering to the mass population.

Cloud players transforming the EdTech space

Cloud based players led by AWS, Google and Microsoft have played a critical role in Indian EdTech space. Cloud based players in the past have identified and nurtured EdTech based startups to help bring there idea online and setup the business. The support came in the form of **coaching, mentoring, technology architecture, making connections within the market and, credit support.**

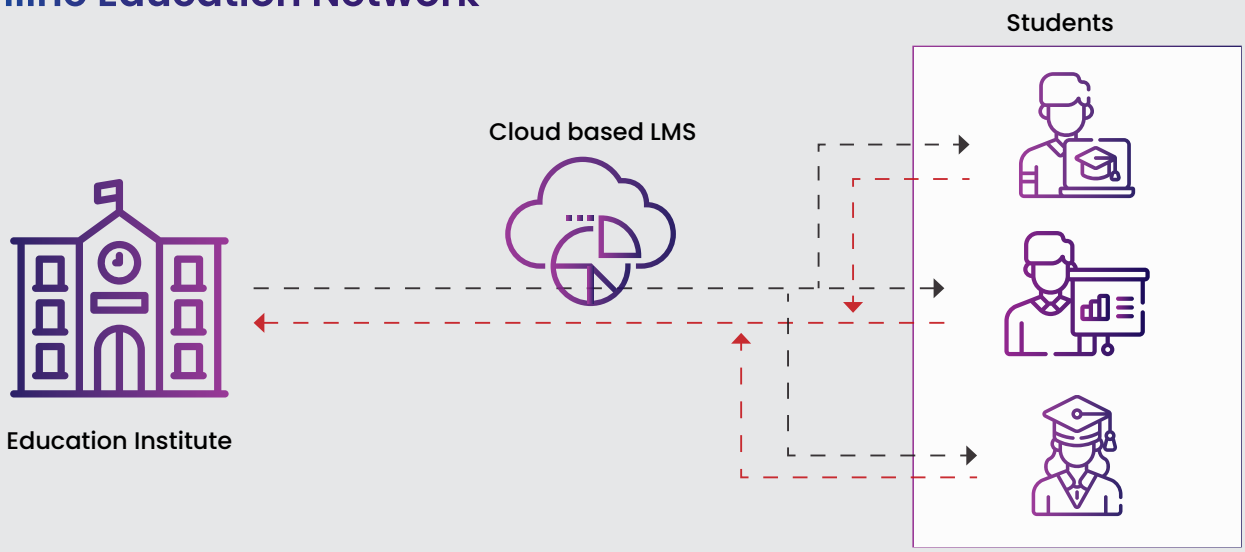
Education institutes in India to deliver online education had two basic requirements

1. Online content to deliver
2. Reliable two-way system/network to connect with students

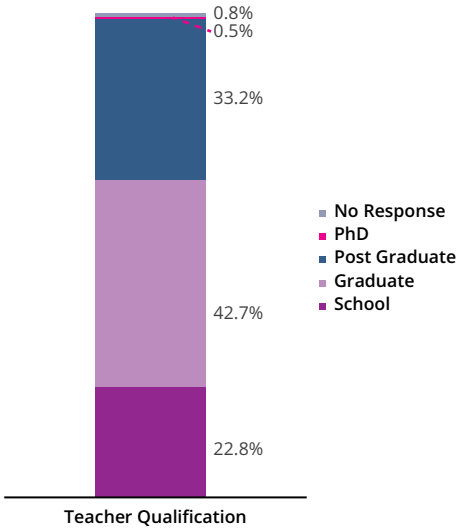
With the backing of teachers, the institutes already had some solution in hand to develop content online and deliver lectures; however, developing the system/network was a challenge. Some institutes have tried to solve the challenge by internally setting up servers, however there were challenges such as seamless connectivity, 24*7 access, load fluctuation handling, and data security.

EdTech players with the backing of cloud-based players came in handy to solve these problems for the education institutes and quickly expand in the COVID-19 pandemic.

Online Education Network



Qualification of Teachers in K12



Key Recommendations

Key Recommendations for the Education Ecosystem

Stakeholders

Education Institutes, Policymakers and Technology Providers

Action Items/ Pillars

1. Sustain and build on technology adoption after Covid
2. Create teacher centric products
3. Provide regional language and multi device support
4. Focus on delivering learning outcomes

Required Support/ Enabling Infrastructure Base

5. **Device & Digital Content** – to increase accessibility and affordability
6. **Cloud Infrastructure** – to enable technology delivery at scale in a secure manner
7. **Skill Upgradation** – to increase technological aptitude and readiness

Glossary

EdTech	Educational Technology. Comprises software to enhance learning and improve education outcomes.
EdTech user	A person who uses an EdTech platform for at least 30 minutes on average per week. For this reason, simple app downloads or dormant users are not categorized as users.
City Tiers	
Metros	Top 8 Indian cities by population considered metros for this study: Ahmedabad, Bengaluru, Chennai, Delhi-NCR, Hyderabad, Kolkata, Mumbai, and Pune.
Tier 1	Non-metro cities with a population of more than 1 million
Tier 2+	Cities and towns with a population between 0.5 million to 1 million.
Education Levels	
K12	Short for "kindergarten to grade 12".
college-goers	Students post K12 pursuing for degrees such as B.Tech, B.E. B. Sc, B Com., MTech, M Sc. Diploma etc
Aspirers	Households with an income of $1150–4500 per annum. Also known as the Next Half Billion (NHB) in this paper. While NHB also includes the "deprived" group, for the purpose of this paper, it refers only to aspirers.5
Deprived	Households with annual income of less than $1150
Mid-high income segments	Households with an income of $4500–18,500 per annum.
Rich	Households with an annual income greater than $18,500
Govt/ Affordable Private School	Schools with monthly fee for students is less than $ 22
Private School (Mid-Premium)	Schools with monthly fee for students is greater than $ 22
Tier 1/ 2 Colleges / Tier 3+ Colleges	MHRD classification of colleges based on their placements, rankings, research programs, campus culture, and location
Others	
NEP 2020	The National Education Policy 2020, which was approved by the Union Cabinet of India on 29 July 2020, outlines the vision of India's new education system
COVID 19	COVID-19 is a disease caused by a new strain of coronavirus, categorised as a pandemic, active from the end of 2019 and throughout 2020 causing global lockdown at its time
Technology Provider	Companies facilitating Ed-tech through various platforms and content for different level of students and professionals
DISE	District Information System for Education
NETF	National Education Technology Forum
LMS	Learning management system (LMS) is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.
Conversion	$1 = Rs. 70

Disclaimer

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About IAMAI

The Internet and Mobile Association of India [IAMAI] is a young and vibrant association with ambitions of representing the entire gamut of digital businesses in India. It was established in 2004 by the leading online publishers, and in the last 16 years has come to effectively address the challenges facing the digital and online industry including mobile content and services, online publishing, mobile advertising, online advertising, ecommerce and mobile & digital payments among others.

Sixteen years after its establishment, the association is still the only professional industry body representing the online industry in India. The association is registered under the Societies Act and is a recognized charity in Maharashtra. With a membership of nearly 300 Indian and overseas companies, and with offices in Delhi, Mumbai, Bengaluru and Kolkata, the association is well placed to work towards charting a growth path for the digital industry in India.

About RedSeer

redseer

RedSeer is a leader in the Internet and new age advisory space. Over the last 11 years of its operations, RedSeer has advised 200+ clients across the breadth of Internet and investment industry in India, Middle East, and South East Asia. With over 300 employees, Redseer Consulting has emerged as the largest home-grown, regional consulting firm in India.

About Amazon Web Services (AWS)

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 175 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster. India is rapidly shifting to a digital ecosystem in hopes of enabling positive socio-economic change. The effort is a combination of government initiatives and the increasing awareness of the benefits of digitization. Amazon Web Services (AWS) helps the government meet its objectives with scalable, on-demand services in the fields of education, transport, and farming.

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Thank You!

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