



ONLINE EDUCATION IN INDIA

OPPORTUNITIES AND CHALLENGES





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EXECUTIVE SUMMARY

Technology has disrupted and impacted us in all walks of life and education is no exception to this. In a post Covid-19 era, we are at the cusp of a greater changes where education system is being redefined placing learner at the center and shifting the focus from teaching to learning through digital modes. Even before COVID-19, high growth and adoption in education technology was evident, with global edtech investments reaching US\$18.66 billion in 2019 and the overall market for online education projected to reach \$350 Billion by 2025. Whether it is language apps, virtual tutoring, video conferencing tools, or online learning software, there has been a significant surge in usage since COVID-19.

Driven by a learner's needs and supported by technology, the education delivery model has changed from being instructor-led to interactive model. The online learning type segment is broadly classified into synchronous and asynchronous learning. Synchronous learning type is gaining more popularity (both in Schools and Higher Education Institutions) owing to the increasing demand for video and live streaming learning solutions. Technologies such as learning analytics, open source digital content, mobile-based learning platforms, etc. have made this personalization of learning possible.

With rapidly changing industry environments, there is even a greater need for academia to match students learning outcomes with industry demands. Learners today need to be equipped with employability skills that are transferable across a broad range of job opportunities and help them modify their approach to solving business problems in dynamic industry environments. While many Universities and Higher Education Institutions (HEI) have started working together with industry by incorporating these skills in their curriculum, there is a huge influx of employers as well, who are now partnering with HEIs and content platforms to develop customized learning programs for their employees to train them for new job opportunities.

We already see a change in attitude, policies measures, remote working, digital collaboration, workplace hygiene etc. The major drivers for this shift are: (a) compulsory measures on social distancing and other impact of Covid-19 (b) phenomenal growth in internet and smartphone penetration (c) low cost of

online education (d) recent government policies; and (e) availability of quality of market players. With over 560 million internet users, India is the second largest online market in the world. It is estimated that by 2023, India will increase the number of internet users by about 40% to between 750 million and 800 million and double the number of smartphones to between 650 million and 700 million.

This report has attempted to comprehensively capture the online education landscape currently existing in the country right from the K 12 space till higher education level. The report has also focussed on the significant investments and contribution of Edtech providers that are not only helping educational institutions in promoting quality online education but are also playing a pivotal role in developing and augmenting an ecosystem of life long learning in the country.

While highlighting the various important government initiatives to effectively promote online education, this report has also analysed the current pandemic crisis and the readiness towards swift adoption of online education under the following six heads, viz technological readiness, faculty readiness, content readiness, infrastructural readiness, security readiness and monitoring and evaluation readiness. There has been special emphasis on the role of fair and effective online assessments and the various effective ways of industry-academia engagement through virtual mode.

Towards the end, the report has a comprehensive recommendation section highlighting the specific role that the government, higher educational institutions and Edtech companies need to play to ensure creating a robust online education system in the country.



SUMMARY OF RECOMMENDATIONS

Areas	Government	Educational Institutions	Edtech Companies
Policy	- Develop guidelines for short, medium and long-term remote learning plans, capacity enhancement & resources allocation - The proposed National Education Technology Forum (NETF) must be set up expeditiously as an autonomous body to facilitate integration of edtech into quality education delivery.	- Compliance of policies and regulations to deliver 21st century learning outcomes and employability skills - Submit timely suggestions and recommendations on latest trends and needs of the sector	- Leverage exponential technologies and come up with offerings/ products that supplement Educational Institutions in effectively achieving the desired learning outcomes of 21st century education - Submit timely suggestions and recommendations on latest trends and needs of the sector
Technology	Government must expedite the favourable policies which can help in building core technological capacities determining country's tech-readiness like multiple MOOCs platform, Cyber Security and Data Centre etc.	- To ensure continuity of teaching-learning practices Institution should consider adopting appropriate Technology Platforms/ Learning Management Systems (LMS) - Leverage Artificial Intelligence (AI), Machine Learning (ML) etc. for administrative, admissions, assessments etc. for seamless and transparent interventions	- Enable compatibility of digital solutions across all platforms. AI based performance analysis for each user. - Enable content development in regional languages through technology - Enable Development of Education stack for facilitating student registry, start up registry, real life research problems
Infrastructure	Invest substantially in creating a robust digital infrastructure including seamless bandwidth support (4G & 5G) across the country. Ensure Provision of interest free/low rates loans to institutions for upgrading digital infrastructure.	Invest in adequate digital infrastructure (high speed broadband internet connectivity & hardware support)	Partner with HEIs & Universities to build digital learning systems (tools, online interface facilities, teaching-learning resources etc.) which can ensure access to quality education for all
Content	Initial fund allocation of 5000 Cr for development of multi-linguistic content for teaching, learning and assessments	Develop an ecosystem for creating contextualised digital content & effective pedagogies for online classes	EdTech companies can leverage technology and research for high-quality multi-lingual content development on relevant disciplines and subject matters

	• Autonomy to top 200 universities to develop online content in different regional languages • Encourage publishing companies to develop digital content in different regional languages	• Build capacities of faculty in mission mode through training on digital technologies & online education	
Faculty Development	Dedicated initial fund of 1000 Cr. for Faculty Development program, 500 Cr can immediately be allocated	Periodic Faculty Development Program with and aim to offer a holistic and multidisciplinary approach towards effective use of tools and technologies	Create short term online courses for upskilling and reskilling of faculty and working professionals
Security	Create guidelines and framework around securitization on online content (including IP) and ensure confidentiality, Data to be encrypted and reside on cloud in India	Install safety net and ensure the online content being offered by the institutions does not get subjected to any Data Theft and Plagiarism	• Design and develop online capsules to train relevant stakeholders on the nuances of online data security • Handhold institutions to build strong security systems for protection of online content
Monitoring & Evaluation (M&E)	• Develop framework to administer and monitor guidelines on screen time of students (Annexure-5) • Facilitate accreditation bodies to develop standards for online programmes • Incentivise Educational Institutions and Edtech companies to implement accreditation of online programmes	• Implement accreditation of online programmes to ensure quality of content, pedagogy and assessment • Periodic training & capacity building of teaching and non-teaching staff members	• Monitor and evaluate periodically the software, communications and networking • Implement accreditation of educational programmes on Edtech platforms to ensure standard and equivalence
Assessments	• Publish and promote detailed criterion based 'assessment rubrics' for various subjects and components that are easily comprehensible to students and teachers • Decentralize Examination System	• Building an assessment framework that promotes pedagogical enhancements and discourages coaching • Create an assessment framework that also trains and tests the teacher in a classroom as also becomes an assessment tool for the school	• Create an Online Assessment Framework that trains and tests the teachers competences and also becomes an assessment tool for the school



Industry - Academia Engagement	Facilitate forum and discussions where we engage industry experts to contribute towards defining learning standards and outcomes on collaboration with educators. There is also a strong need to include social and mental health and wellbeing experts in these dialogues.	Integrating a robust skills and socio-emotional learning (SEL) curriculum into the mainstream.	Develop products that can be self paced and useful in the hands of students, teachers and parents both for skills and for SEL.
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CONTEXT & BACKGROUND

Digital technologies have a profound impact on economies and societies and are changing the way we work, communicate, and engage in social activities. One of the most radical changes that one has been discussing for more than a decade now is around the technological disruption that has significantly impacted education sector and is being looked at, as the biggest intermediary of teaching-learning processes. The current pandemic has left more than 1.6 billion students out-of-school. Similarly, over 220 million post-secondary students of universities and other tertiary education institutions in 175 countries, have had their studies ended or significantly disrupted due to COVID-19. In this pandemic, the global educational landscape is undergoing a dramatic transformation. Many Educational Institutions and Training Centres have transitioned towards online mode of teaching, learning and training to mitigate the impact of COVID-19 on education.

Continued internet evolution, large scale increase in smart devices users and their applications have changed the outlook of Global Education. The global online education market is projected to witness a CAGR of 9.23% during the forecast period to reach a total market size of US\$319.167 billion in 2025, increasing from US\$187.877 billion in 2019. Increasing penetration of internet in many regions across the globe is a major factor driving the market growth. Growing adoption of cloud-based solutions coupled with huge investments by major market players towards enhancing the security and reliability of cloud based education platforms, is further increasing its adoption among the end-users. Presence of a large number of service and content providers in the market is bringing huge volumes of educational content online.

Declining hosting cost and growing need for accessing educational content is further fuelling the adoption of this technology, thus augmenting the market growth. Advancements in the field of artificial intelligence and rapid growth of Internet of Things (IoT) will continue to enhance the user experience on these online education platforms, which is anticipated to spur the market growth throughout the forecast period. In India too, 'new-age' education system is preparing itself to the learning needs and challenges of enterprise 4.0.



The penetration of digital education into the hinterland / rural market is evolving fast. The proliferation of digital tools and applications has further transformed the learning communication practices. It has re-defined teacher-learner interface, training pedagogies, instructional design and educational curricula too.

India's internet users registered double digit annual growth of approximately 18% to reach 627 million in 2019. Indian mobile data users consume 8.3 gigabits (GB) of data each month on average, compared with 5.5 GB for mobile users in China and somewhere in the range of 8.0 to 8.5 GB in South Korea, an advanced digital economy. The public and private sectors are both propelling digital consumption growth. The





government has enrolled more than 1.2 billion Indians in its biometric digital identity programme, Aadhaar, and brought more than 10 million businesses onto a common digital platform through a goods and services tax.

Competitive offerings by telecommunications firms have turbocharged internet subscriptions and data consumption, which quadrupled in both 2017 and 2018 and helped bridge a digital divide. Based on current trends, it is estimated that India will increase the number of internet users by about 40% to between 750 million and 800 million and double the number of smartphones to between 650 million and 700 million by 2023.

Over the years, India has invested focussed to improve access to education and quality of education was compromised. This has resulted in increased enrolment with unsatisfactory educational and employability outcomes. Elementary education has become nearly universal, with a gross enrolment ratio of 96.9% in 2015–16. Trends also show significant improvement at the secondary and higher secondary levels: from 2010–11 to 2015–16, the gross enrolment ratio for secondary schools increased from 65% to 80.1%, and from 39.3% to 56.2% for higher secondary. Digital content and channels provide a powerful opportunity to bridge remaining gaps in access and improve learning outcomes through personalised education delivery mechanism. Interactive and gamified digital content that is tailored for individual students can improve retention and learning outcomes by making instruction more effective.

On Higher Education front too Institutions are adopting hybrid models to combine quality campus experience with job-relevant skills delivered to students through online learning platforms. There is a growing trend of synchronous and asynchronous teaching-learning practices. Advance Learning Management Systems (LMS) with its right knowledge management tools is helping in improving the design and delivery of educational courses being offered by Universities and Colleges in India. MOOCs platforms are enabling self-learning in a crucial way. Leading online education providers like Upgrad, Extramarks, Coursera, EdX, Udacity, Khan Academy, etc are providing multiple courses and facilitating shifting of select courses online.



GOVERNMENT DIGITAL PUSH

Learning through the digital medium is not something new for India. The government has used electronic media since the days of radio and then Doordarshan's Gyan Darshan. Several school programs like Diksha, e-Pathshala, NROER (National Repository of Open Educational Resources) have been in existence for quite some time now. Diksha has more than 80,000 e-Books for classes I to XII created by CBSE, NCERT and States / UT which are available in multiple languages. E-Pathshala is a portal where NCERT has deployed 1886 audios, 2000 videos, 696 e-Books (ePubs) and 504 Flip Books for classes I to XII in different languages. Similarly, NROER is a portal has a total of 14527 files including 401 collections, 2779 documents, 1345 interactive, 1664 audios, 2586 images and 6153 videos on different languages. In addition to this, the Government has announced several technology enabled initiatives to mitigate the impact of COVID-19 on education. SWAYAM PRABHA DTH channels have been launched to support and reach those who do not have access to the internet. The contents on SWAYAM PRABHA are provided by NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS.

The DTH Channels cover curriculum-based course contents at post-graduate and under-graduate level courses in disciplines such as arts, science, commerce, performing arts, social sciences and humanities, engineering, technology, law, medicine, agriculture, etc. The UGC (Credit Framework for online learning courses through SWAYAM) Regulation 2016

advises Universities to identify courses where credits can be transferred on to the academic record of the students for courses done on SWAYAM.

Three channels were already earmarked for school education; 12 additional channels have been added. The Government has tied up with private DTH operators like Tata Sky & Airtel to air educational video content to enhance the reach of these channels. PM eVIDYA- A programme for multi-mode access to digital/online education will be launched immediately, this would entail: 1) DIKSHA for school education in states/ UTs: e-content and QR coded Energized Textbooks for all grades (one nation, one digital platform); 2) One earmarked TV channel per class from 1 to 12 (one class, one channel); 3) Extensive use of Radio, Community radio and Podcasts; 4) Special e-content for visually and hearing impaired

The draft National Education Policy (NEP) 2019 has laid emphasis on leveraging open and distance learning for improving access to quality learning experiences to: i) enhance access to higher education, including professional and vocational education; ii) promote life-long learning and certification through reaching out to people engaged in various livelihoods as well as those who wish to re-enter the formal education system; and iii) support the continuous professional development of teachers in school and higher education. On skilling front too, Government has launched e-skilling portal to ensure continuity to teaching- learning practices.



PRIVATE SECTOR INITIATIVES/INVESTMENTS

During the current crisis many Indian firms such as Extramarks, Byju's have been providing free access to its complete app to school students. Companies like Google, Microsoft, Zoom, SeeSaw etc. are providing services to help parents, teachers, schools and school administrators facilitate student learning and provide social care and interaction during periods of school closure. Most of the solutions curated are free and many cater to multiple languages. These solutions tend to have a wide reach, a strong user-base and evidence of impact. They are categorized based on distance learning needs, but most of them offer functionalities across multiple categories.

The online education market is segmented into primary and secondary supplemental education, test preparation, reskilling and certification, higher education language, and casual learning. The online primary and secondary supplemental education segment was valued at INR 11.99 Bn in 2018 and is expected to reach INR 123.65 Bn by 2024, expanding at a CAGR of 46.48% during the 2019-2024 period. The change in consumer behaviour towards detailed learning and surge in demand from tier II and tier III cities are driving the growth of this segment.

The online test preparation market is expected to reach INR 94.75 Bn by 2024, expanding at a CAGR of

50.84% during the 2019-2024 period. This segment is expected to be the fastest-growing segment in the online education market, owing to growth in career-focused population, enhanced Internet infrastructure and increased penetration of digital payment methods.

The online higher education market was valued at INR 5.01 Bn in 2018 and is expected to reach INR 40.63 Bn by 2024, expanding at a CAGR of 40.74% during the 2019-2024 period. The conventional education system is insufficient for the growing population, and therefore students are switching to online higher education courses.

The online reskilling and certification market is expected to reach INR 93.81 Bn by 2024, expanding at a CAGR of 36.95% during the 2019-2024 period. The growing business landscape has widened the skill gap among employees, which is why the demand for reskilling courses is picking up.

Gamification is one of the most prevalent trends among online education providers private firms to encourage learning through immersive experiences. Simulation of concepts, level advancement badges and incentive-based learning are driving user engagement on online education platforms. Private firms are utilising such opportunities to ensure facilitating environment.



CURRENT DISRUPTION: RE-DEFINING THE DIGITAL/ONLINE LEARNING

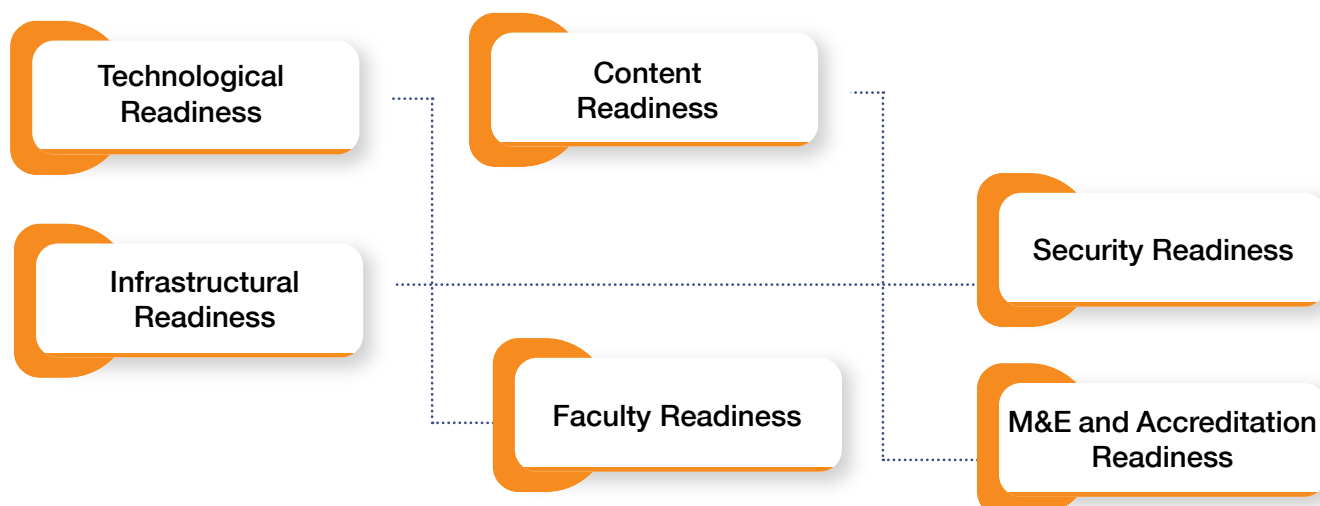
Technology is transforming jobs and skills faster than organizations or people can adapt. Even before the pandemic started, we were witnessing impact of emerging technologies on education and skills. Research from the World Economic Forum suggests that the core skills required to perform most job roles will change by 42% on average by 2022. FICCI Future of Jobs report states that by 2022 almost 37% of workforce would be deployed in jobs that will have radically changed skill-sets. At this level of disruption, companies are scrambling to identify and source the skills they need to stay competitive.

In the wake of current disruptions and massive closure of Educational Institutions, education systems around the world are facing an unprecedented challenge. Governmental agencies are working with international organizations, private sector partners and civil society to deliver education remotely through a mix of technologies in order to ensure continuity of curriculum-based study and learning for all. Establishing or scaling up distance learning strategies are a sector-wide response to sudden interruption of educational processes as a result of unexpected COVID-19 closures. These strategies are guided by a concern for equity and inclusion and the need to ensure the design and delivery of distance learning do not exacerbate existing educational and social inequalities. The planning of more comprehensive distance learning strategies should, however, be guided by both immediate mitigation needs and long-term goals. Beyond the response to the current crisis,

the efforts to deploy distance learning at scale across all levels of education provides valuable lessons and may lay the foundation for longer-term goals of building more open, inclusive and flexible education systems after the COVID-19 pandemic has passed.

Private sector has also stepped up its efforts to ensure continuity of teaching-learning practices. Between December 2019 and February 2020, Edtech ventures have garnered USD 686.32 million in 21 funding rounds, a marked improvement from 450 million in 87 rounds in 2019. This has helped the private players in scaling up their product innovation and contextualised offerings. The demand for online courses and learning has seen a sudden surge since the lockdown. This clearly indicates the huge demand that is rising for online learning. Online learning has been adopted in various countries as the primary mode of education. The e-learning method requires a good internet connection and a computer/mobile as essentials. The sessions can also be recorded for later use. Having said this, virtual classrooms are not as simple as plug-and-play. As we all know schools and higher education institutions thrive on structure, timetables, daily attendance, and lesson plans—a meticulous, planned operation that has been made to transform into an online mode practically overnight. Educational institutions are now going multimodal—a mix of live classes, recorded lessons, physical textbooks, and online tests and questionnaires. *(Annexure-1: Anderson's online learning model)*

The current crisis and shift towards online education (K-12 and Higher Education) should be analysed under the following six buckets:



Technological Readiness

One of the most important aspects of e-learning readiness is the technological aspect, which plays an important role in implementing an effective and efficient e-learning system. There are eight technological factors determining the tech-readiness: Software; Hardware; Connectivity; Security; Flexibility of the system; Technical Skills & Support; Cloud computing; and Data centre. The following factors are important to determine technological readiness:

► Mobile-based learning

The Nielsen Primary Survey conducted an extensive study in 2018-19 for the Indian subcontinent. Its findings revealed that 57% of the online learning audience relied on their smartphones for active content consumption enabled by the mobile-first focus of the Ed-Tech platforms. With smartphones becoming an intrinsic and indispensable part of urban and rural India, edutech platforms are ushering a knowledge revolution by seamlessly imparting primary, secondary and higher education, test preparation, online certification and soft skills training.

► MOOCs (Massive Open Online Courses)

A Massive Open Online Course (MOOC) is an online course designed for unlimited participation and open access through the web. The extant prerequisites to learning have seemingly dissolved with the dawn of Edu-Tech platforms and e-learning. All that is required is the desire to attain knowledge and a smartphone or computer. Ed-tech platforms today offer more than 5000 courses taught by educators globally with equal and open access to all.

► Interactive Classrooms

Technology readiness is very much evident in creating interactive classrooms aspects. Ed-Tech platforms have been offering courses for various competitive examinations such as JEE, NEET, UPSC and GATE preparation for students to participate in real-time remote classroom discussions. This assists students in assessing their coursework progress, spotting improvement areas and receiving mock tests for exam preparation. Through the massive innovations in Big Data, teachers & experts are able to share feedback and assess the learning outcomes.

► Use of AR/VR/MR in Learning

As per an Edtech report, the Indian Educational VR market is set to rocket at a compounded annual rate of 55% and educational AR by a staggering 82% by 2021. There are private firms which are already offering these technologies for educational institutions and training centres. End users are finding such emerging technologies extremely useful as they are helping in real-time observation and participatory engagement in place of outmoded theories and didactic stagnation.

Infrastructural Readiness

Remote learning can ensure that students continue learning through a variety of avenues. While digital technologies can offer a wide set of capabilities for remote learning, most of the rural India is still struggling to have access to high speed internet connectivity. The digital devices do not support all the effective tools of learning. Infrastructure readiness is not just about broadband connections and smart devices but there needs to be a focus on overcoming the barriers of language and content as well. It is also crucial to ensure that students, in both rural and urban areas, get access to the best of the learning resources. Another key aspect of infrastructural readiness is to build capacity to develop contextualized courses with the latest online reference material than publishing books.

This generally includes levels of readiness in both technological capacities of digital learning platforms or TV and radio broadcasting systems to provide curricular courses remotely to all learners, as well as in household access to electricity, telephones, televisions, radio, digital devices, internet connectivity and data. Remote learning can ensure that students continue learning through a variety of avenues.



Content Readiness

As we move to a greater proliferation of devices, combined with the fact that we will be accessing more content from multiple places, a greater value will be placed on the content, and how that content is used, rather than on any one particular device. Viewed from this perspective, the future of education is in the 'content', not the 'container'. In many countries, gaps exist in terms of the resources and local expertise needed to rapidly develop national curricula courses readily accessible through online platforms or TV and radio programmes. Creating digital content and related competencies is a key to swift transition towards online education. Increasing digitalization is making way for new communication instruments enabling faster knowledge sharing in schools, colleges and training centres. It is also important to organize existing content so that students and teachers understand what is available and the sequence in which it should be taught.

Faculty Readiness

Faculty readiness to teach online is one of the most important aspects of online teaching. Due to current crisis, there is a recognized need for professional development to prepare faculty to teach online, and there are many different faculty development models being implemented with differing forms of technology, pedagogy and course content and course content. This includes preparedness of teachers to design and facilitate online learning modules in Synchronous and Asynchronous modes. Course design is identified as a pedagogical competency, alongside course implementation, facilitation, and assessments to cover learning outcomes.

In the online teaching pedagogy a teacher must provide an active learning environment in which learners take ownership of their learning. Teachers also need to be trained on setting up virtual classrooms and varied pedagogies to engage with students. Recognition of a student's capabilities and limitations, and understanding of student expectations & motivations are key for faculty to effectively use online tools. There has been growing shift towards faculty development, both by government and private sector, but a lot still needs to be done.

Security Readiness

Security in online learning refers to protection from malicious or accidental misuse of resources in online learning. Subject matter experts indicate that security has three basic requirements: confidentiality, integrity, and availability. IPR and Plagiarism are also areas of concern and require safety net. The increasing use of e-Learning systems has been documented by numerous studies and shows continuing growth; little attention has been given to the issue of cyber security of e-Learning systems both in research and education. Consequently, the e-learning environment is inevitably exposed to constant security threats, risks, and data theft. Unfortunately, many educational institutions are rushing into adopting online learning management systems without careful planning and without a thorough understanding of the security aspects of online learning.

M&E and Accreditation Readiness

The current discourse on global education notes a shift in focus and the emergence of new challenges. This warrants new impetus to periodic measurements of progress made in the education sector, including the diverse nature and profile of end users of online education. Most of the Government owned programs have data systems, already established for measuring the results of any programme on the target group/population. The private sector institutions are also using various algorithms to monitor effectiveness of online teaching-learning. This includes capacities to monitor distance learning processes, to track the access to courses and engagement, to assess learning outcomes, and to sustain immediate distance learning responses for achieving long-term goals. In the context of online learning, it is critical to monitor differences in the level of participation and engagement of students who often have weaker self-regulation and self-organization skills. When TV or radio programmes, which are one-way knowledge transmission systems, are adopted as the main solution, it is more challenging to measure the extent to which students, teachers, and parents or caregivers are engaged with distance learning.

Accreditation of online programmes becomes imperative for continuous monitoring and evaluation to assess learning outcomes and employability quotient. The upcoming National Education Policy (NEP), while highlighting that accreditation will be the lynchpin of the regulatory system also has emphasized on the fact that the online programs should be of extremely high quality and be treated at par with in-class teaching. The draft NEP has also indicated that National Assessment and Accreditation Council (NAAC) shall be reinvented and separated from the UGC into a completely independent, autonomous body and be given the responsibility of overseeing accreditation of all institutions of higher education, across all disciplines and field. It further goes on to state that NAAC shall function as the top level accreditor, and will issue licenses to as many Accreditation Institutions (AIs) as are needed to cope with the workload of accreditation. However, it is important that NAAC clearly specifies the modalities of effective accreditation of online education by the empanelled accreditation agencies.



ASSESSMENTS

Assessment is one of the most crucial elements in addition to above mentioned 6 key pillars in enhancing the overall quality of teaching and learning. What and how students learn depends to a major extent on how they think they will be assessed (Biggs & Tang, 2017). All assessments lead to some amount of student learning, but a fundamental challenge lies in stimulating the right kind of learning. Therefore, it is important that assessment practices are designed to send the right signals to students, parents and industry in shaping the effectiveness of student learning & educational outcomes – about what they should learn and how they should learn. From a student's perspective, the relationship between learning and assessment often comes down to 'grade'. For parents and industry it means employability and life skills.

In the new-age of teaching-learning practices, it is even more important to adapt to needs of 21st century methods of measuring learning outcomes. Exposing students to multiple assessment formats such as Portfolios, Lab Analysis, Field Studies, Industry linked Projects etc becomes crucial. Decentralization of examination becomes important with following key components:

- Have a set of 'summative assessments' in various subjects that could be 'Internally Assessed' and 'Externally Moderated'
- Have a set of 'Project Based Unit' in various subjects that could be 'Internally Assessed' and 'Externally Moderated'
- Provide for appropriate weightage for both the above in the final score of the student
- Compile data around scores assigned internally and their moderation, if any – use this analytic for professional development

Due to growing shift towards digital teaching-learning, Educators are also facing a lot of challenges with online assessments- validity and trustworthiness- are the major ones. To assess if an assessment type could be used we have to look at the validity and trustworthiness of the type of assessment, the same is described below:

Validity- It indicates if the assessment type covers the learning objectives of the course. Reliability, Transparency and Feasibility are key components to validate an assessment structure.

Trustworthiness -In order to assess the trustworthiness of an assessment type one should think primarily of preventing cheating and also inclusivity, accessibility and privacy.

Even if an assessment is validated and trustworthy, it has to be a mix of tried & tested along with new ways of assessing a learner. We can look at select few which have been used extensively by educators:

1. **Essays, Reports and Project Presentations** remain a valid and trustworthy type of assessment as students will still have the same type of resources to use. However, one should be watchful of plagiarism and it can happen more often as there is less interaction with faculty, thus the institution needs to have plagiarism check technology in place, such as TurnItIn.
2. **Verbal Examinations/Tests** can now move to online 1-on-1 sessions via web conferencing technology like Zoom, TEAMS or Webex. Bandwidth may play an important role for students. Thus, faculty should take into account how accessibility and internet speed at students' place.
3. **Written Exams** are less likely to occur in online courses - be it open book, closed book or digital. These types of evaluations have to be taken into account only after evaluating the available resources at the institution but students. Faculty can consider using tools like Proctorio, ProctorU, Exam.net to lock the device of the students as try to cheat.
4. **Live Tests using locked browser.** In such a test students are required to use a 'Locked Browser' with online quizzes and tests. This is a custom setting that literally "locks down" the browser that displays the test or quiz, preventing students from copying or printing the questions or accessing any other websites or applications.
5. **Variable Testing:** Students tend to share old tests, use study material sharing sites to share answers and methods, etc. To prevent cheating, faculty members may find it useful to use question banks and randomize the questions so that students have a more difficult time in sharing answers. Faculty should change assessments each semester or

create multiple versions of tests or quizzes for a class. Include essay or explanation questions, as it makes it more obvious if an answer was copied from somewhere else. If possible, consider pooling questions so all students get similar but slightly varied test questions.

6. **Assign collaborative learning activities:** Effectively use collaborative activities as one of the important assessment tools. Consider using social media, shared documents, discussion forums, video conferencing, and other types of collaborative tools to engage students with one another. Studies indicate collaboration in online classes increases problem-solving skills more effectively than the student who is completing all classroom activities alone. There is little motivation or ability to cheat when students are working cooperatively for a common goal.

In addition to the above mentioned options, many schools, colleges and universities have policies about cheating as part of their 'student code of conduct', and these are perhaps the simplest methods to deter cheating. Many institutions ask students to sign an honor code statement in an initial assignment or prior to each test.

With the current shift towards online education, it is also important to look at the enforcement opportunities. Online education ensures continuity of teaching-learning practices but also poses big challenge of academic integrity. If teachers and students follow academic integrity as there is no reason to not accept that online education can successfully be continued in blended form.



INDUSTRY–ACADEMIA ENGAGEMENT TO PROMOTE ONLINE EDUCATION

Enabling regulatory frameworks can recognize the changing education ecosystem and support HEIs and schools to be agile and flexible in rapidly changing labour market needs. In the current crisis, academia, industry and government need to collaborate together to promote research and develop innovative solutions to solve new business challenges. Apart from commercialization of research by industry, such collaborations could exploit synergies and complementarities of scientific and technological capabilities. Supported by technology advances, researchers can network with each other through virtual groups and use data analytics to mine huge quantity of open source data for their research output.

The new normal of 'Digital Workplace' has further opened up new opportunities for industry-academia engagements. Apart from exposing students to industry environments through virtual internships and apprenticeship models, Universities, HEIs and Schools would need to develop deeper symbiotic partnerships with industry to collaborate on the development of curriculum and integrate new-age pedagogy. With online content providers offering learning programs,

research will be one of differentiators for Educational Institutions in future where they can stay ahead of open source content by enriching their curriculum with the latest research findings and outcomes. They could utilize technology to develop short-term online programs that focus on expanding the learning objectives to include new-age skills such as problem solving, analytics, reasoning, communication, etc.

To meet the digital demand, educational institutions are investing strategically in building digital infrastructure (LMS, High-speed connectivity etc.), creating virtual environment to promote innovation & entrepreneurship, setting up virtual labs and much more. There is an increasing offering from academia of online programs for students on computer science skills / new-age digital systems / technologies like AR/VR. Educational institutions are developing new curricula/courses on digital tech trends (AI, Cybersecurity, Industrial Internet of Things, Connected Systems, etc.), furthermore, institutions can work closely with industry to get such programs/courses validated. Following could be key areas of virtual collaboration between Industry-Academia:

Alignment Strategy	Indicators of Engagement
Awareness	Future Skills & Future of Jobs
Research & Innovation	Identification of current business needs and backend R&D activities
Knowledge Transfer	Sharing of Case Studies
Student Support	Virtual Internships and Apprenticeships

Supported by technology, collaboration has been a central theme in the way research is conducted at some of the leading HEIs. With increased collaboration between different stakeholders and digital sharing of data, to address issues involving intellectual property and ethical use of technology, HEIs need to inculcate a strong ethical foundation amongst its students. With limitations on opportunities to experience real-life working scenarios, educational institutions in partnership with industry could use emerging technologies such as AR and VR to simulate environments where learners can apply their knowledge.

DETAILED ACTION PLAN

For Government

➤ Government in consultation with key stakeholders (Broadcasters, EdTech Companies, Educational Institutions and Training Providers etc.) should assess existing capacity and resources to support a multi-faceted remote learning model, including a combination of technologies and delivery mechanisms.

1. The short-term plan should focus on emergency response to current crisis and ensure continuity of teaching-learning through digital and other communication modes like DTH channel, Radio, podcast etc. in an effort to not leave out children from government schools in rural and remote areas.

- Allocation of INR 1000 Crores to be immediately made for concerted efforts to provide Laptop/Tablet/ Smartphone for each and every child to ensure deeper penetration across India. Provision of interest free loan too must be made available.
- **Mission mode Capacity Building and Teacher Training** must be at the centre of the new reforms.
- Much like text books, all ed-tech learning solutions, digital content, e-books, testing tools and technology platforms for all schools, colleges, training centres and students, **GST should be exempted.**
- The leading Indian universities **should be allowed and encouraged to engage with top foreign universities/entities and create joint online programs.** This will not only enhance the learning experience of students but will also help in revenue generation.
- The draft NEP just highlights about AI, Blockchain and VR while areas such as Voice, augmented reality, IoT and many others are just as crucial. It is suggested that the policy should be technology agnostic and flexible enough to incorporate any new technology that may become relevant to educators.

- **The SWAYAM PRABHA TV**, delivering quality content, especially in rural areas should not just be offering courses developed by public Institutions but provision should be made for private universities also to curate courses.
- There should be a **provision for Open and Distance Learning Institutions (ODLIs)** to be offered grants and soft loans for quick upgradation of digital infrastructure.

2. The medium-term plan should focus on pragmatic guidelines on continued usage of online teaching even after institutions reopen. Hybrid models must be facilitated for ease of education delivery keeping in mind the need for maintaining SMS (Sanitisation, Mask and Social Distancing) Post COVID. Each child /learner must be equipped with at least one device with requisite connectivity to access digital content.

- Allocation of INR 10000 Crores for ensuring sound digital infrastructure across the country along with last mile connectivity.
- **Recognise Blended Learning as an effective means.** Government should recognise and expect blended learning as an effective means of learning even in a post Covid situation. It is time that the Boards recognise and expect schools to have models to use virtual content for knowledge dissemination. CBSE's own definition of 'K12 school' must change and should be more credit based like AP/A Levels.
- **Improve access to digital resources by enhancing connectivity.** Although Government has invested extensively to build the digital infrastructure and required bandwidth support, however in many rural areas improving connectivity is the first step in helping reach a large audience and mitigating access inequities. Government needs to invest in improving telecom infrastructure and develop a robust digital infrastructure with

high speed broadband internet connectivity across the length and breadth of the country. This should be completed in a mission mode.

- Universities and HEIs that meets the criteria for the online platform, data privacy and course requirements, **should be allowed to host courses for credit or certification** from other MOOCs platform such as Upgrad, Unacademy, Khan Academy Coursera, Edx, etc.
 - **National Education Technology Forum (NETF)**, as mentioned in the draft New Education Policy (NEP), must be empowered, and should be made an autonomous body to develop the education technology roadmap and implementation mechanism for universities/HEIs.
 - **National Academic Credit System** should be implemented, and students be allowed to earn credits for online courses. The credit equivalence system should include all those online learning platforms that has a minimum of 100K learners enrolled with them
 - Subject areas that do not require heavy lab work should be allowed to be offered under online degree - like Law / Management / Computer Science / Data Science / AI.
3. The long-term must focus on rapid development and scale-up of the designated remote learning modalities. Content development, pedagogy, assessment & evaluation, securitisation of online content, M&E etc. for quality education delivery.
- **Promote digital portfolios** for Children from grade 6 to 12. Children would own their progress through genuine work through the years.
 - With 'Work From Home' becoming a reality, time has come for '**Blended Home Schooling**'. In order to facilitate the same, premier boards such as CBSE, and not just NIOS should also allow students doing home schooling, virtual schooling to appear for CBSE exams. (details listed in Annexure-3)
 - **Flexibility in choice of credits** from same or other disciplines should be allowed. Courses in engineering that do not require lab work should be allowed to be offered online.

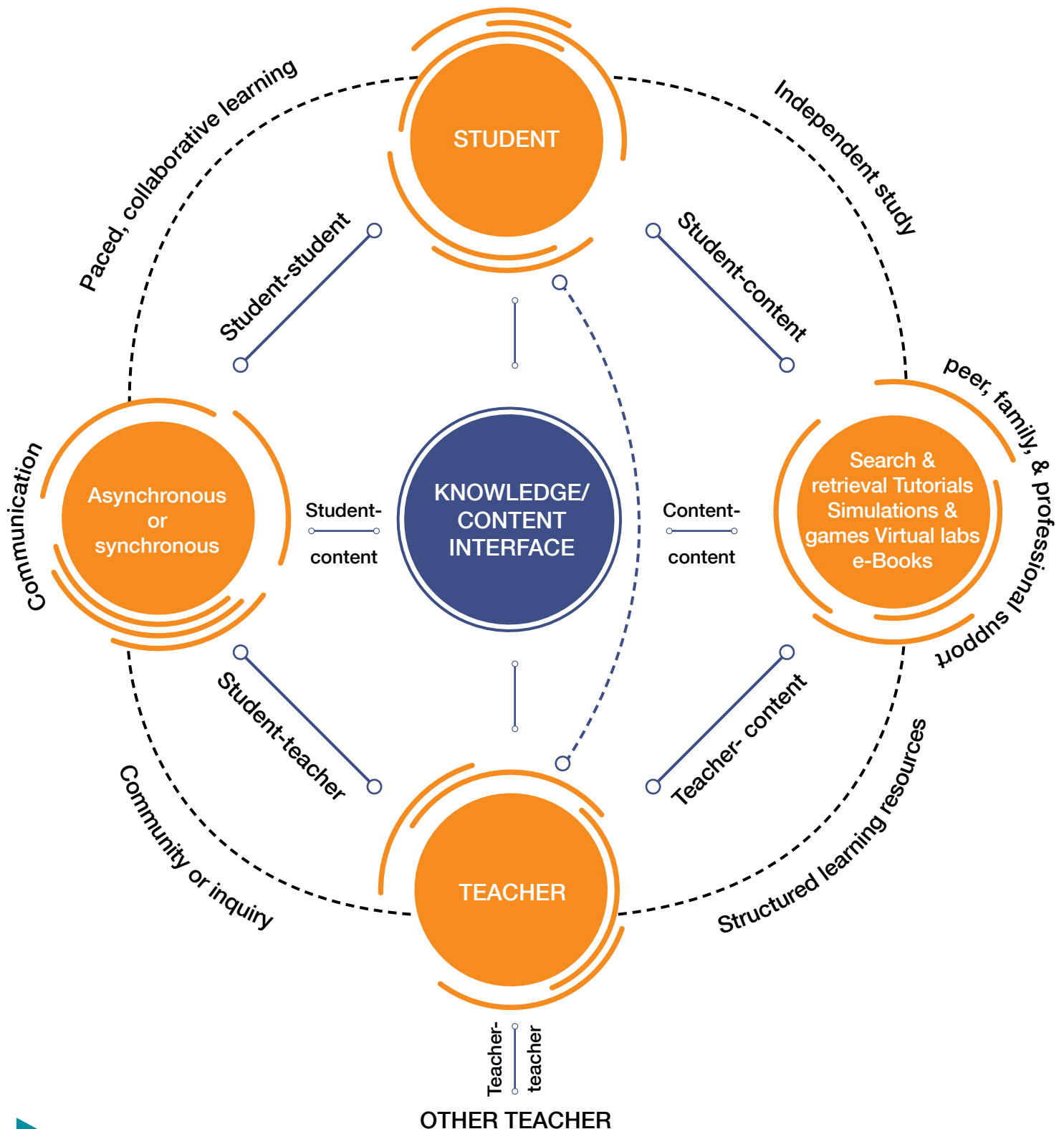
Equity should be a top consideration in all planning efforts, as the most vulnerable students are most probably affected disproportionately hard and lack the ability to access digital resources. *(Guiding principles listed in Annexure-2)*

For Educational Institutions, EdTech and Training Companies

- Schools, Higher Education Institutions and Training Providers **should promote and encourage focused capacity building programs** for their faculties/ teachers/trainers. *(FICCI led Faculty Development Program listed as Annexure-5)*
- Develop a **facilitating environment for teachers** so that they can in turn support learners in a new learning environment; can develop high quality digital learning content and assessment tools.
- **Integrate AI and data management systems** for effective monitoring and evaluation of learning outcomes.
- To prepare the workforce for post COVID crisis, Institutions should focus on **skill oriented content & pedagogy and promote continuous learning** amongst the working professionals through the deployment of short term online skill courses.
- **Organize digital Educational content** to align with existing curricula can be critical in providing users and teachers easy access to relevant information.
- **Provide supplemental guidance and support** to parents on how to use and access remote and online learning content.
- **Credible edtech companies** (with criteria like those with greater than Rs. 50 crores of revenue or more than 10,000 students) should be permitted to offer online diploma programs and grant recognition to such programs.
- **Skilling and Training Providers should work in collaboration** with Educational Institutions to develop skill-oriented content/courses.

Annexure-1

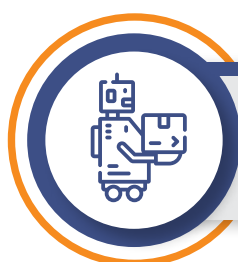
Anderson's Online Learning Model:



OTHER TEACHER

Annexure-2

Policymakers should assess their systems' capacity and resources to support a multi-faceted remote learning model, including a combination of technologies and delivery mechanisms. During this process, policymakers should consult all the relevant stakeholders (e.g. state governments, broadcast regulators/companies, EdTech startups etc), ensuring the rapid development and scale-up of the designated remote learning modality. Equity should be a top consideration in all planning efforts. Following should be guiding principle to plan scaling up of online education:



Design for Scale: Use technology that already exists and widely used and combining technologies for multi-modal delivery such as radio with text messaging.



Empowered Teachers: Technology should enhance teacher's access to content, data and expertise to improve teaching and learning.



Engage The Ecosystem: Education systems should take a whole-of-government and multi-stakeholder approach, must bring together stakeholders like telecom companies, publishers, local EdTech startups, radio and TV stations.



Data Driven: Set up feedback mechanism to collect, analyse and respond to feedback.



Annexure-3

New Age Schooling formats: It is time that we move away from rigid campus and attendance-based system and promote:

- **Hybrid Model of Schooling – Blend of in school face-to-face and on-line** will emerge, with significant benefits. This is an approach to systematically mix face-to-face teaching with online learning, where the online component can be delivered through both synchronous modes and asynchronous modes, where people learn in different locations at different times. The integration of information technology in education will be further accelerated and that online education will eventually become an integral component of school education.
- **Home Schooling:** Home Schooling is not widespread in India, but it has been gaining importance in the recent years. In the coming times, homeschooling will take the place of the classroom. Many parents may opt for this format of schooling on the pretext of health and safety of their wards. At present, homeschooling is not regulated by any of the government authorities. As a result, homeschoolers do not have to be registered with any of the present government agencies or authorities. Children who are homeschooled can appear for board examination conducted by NIOS (National Institute of Open Schooling) after the age of 14 years or IGCSE (International General Certificate of Secondary Education) examination.
- **Changed role of the teacher:** The notion of a teacher or an educator as the knowledge-holder who imparts wisdom to pupils is no longer fit for the purpose of the future. With students being able to gain access to knowledge, and even learn many a technical skill, through a few clicks on their phones, tablets and computers, we will need to redefine the role of the teacher in the classroom of tomorrow. This may mean that the role of teachers will need to move towards facilitating young people's development as contributing (and employable) members of society, rather than just lecturing.
- **AI will personalise learning:** The opportunities — and challenges — that the introduction of artificial intelligence (AI) could bring to the sector are significant. Many schools and higher education institutions in the country face a wide range of challenges, including disengaged students, high dropout rates, and the ineffectiveness of a traditional “one-size-fits-all” approach to education. But when big data analytics and artificial intelligence are used correctly, personalized learning experiences can be created, which may in turn help to resolve some of these challenges.
- **Examination & grading will undergo a change.** AI will help teachers deal with assessment, evaluating, paper setting, making mark-sheets and tracking the performance of each student with less tedium. With these tasks made simple they will be able to concentrate more on course improvement, teaching quality and aptitude development.

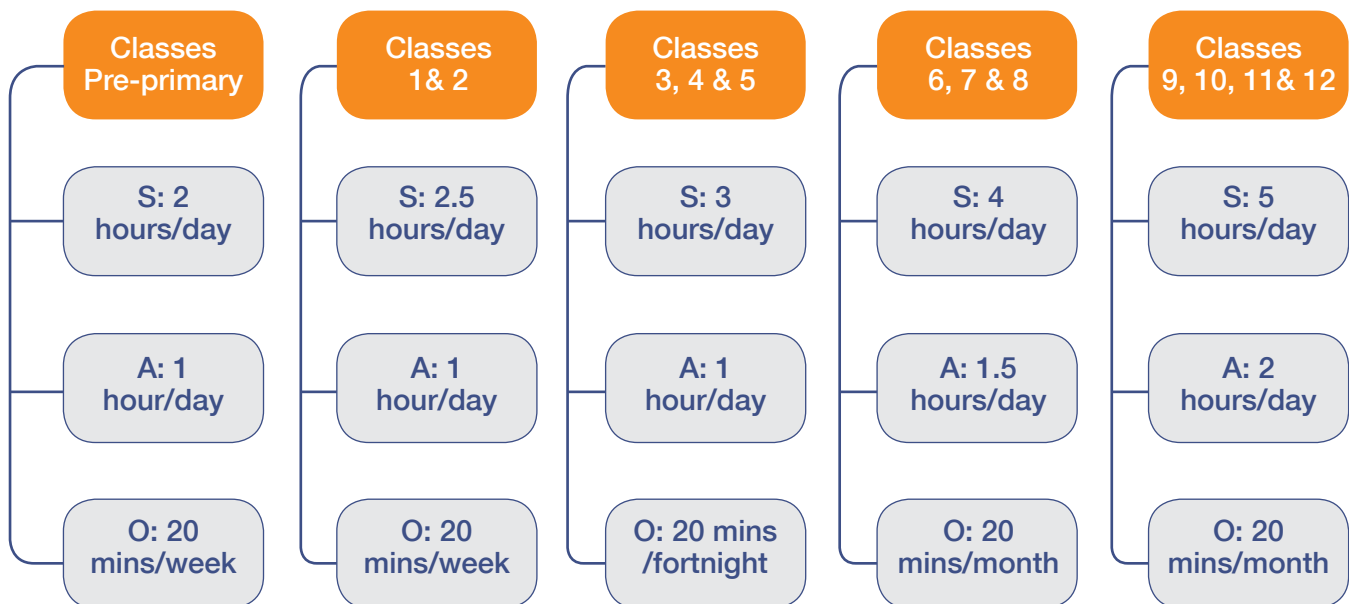
Annexure-4

FICCI Future-X Professional Development Program aims to offer a holistic and multidisciplinary approach to help & empower participants in effective use of tools and technologies. Through our various courses under Faculty Development Module, we are handholding participating Faculty Members to learn new pedagogies for online teaching-learning, classroom engagement strategies and ways of assessments. Our Professional Development Program covers strategic decision making during the current crisis, risk-assessment models, financial management, models of forging effective collaborations, new ways of promoting research & innovation and other matters of importance for leadership decision making. All the sessions involve Live Sessions, Presentations, Case Studies Discussion, Videos etc.



Annexure-5

Tentative Schedule to ensure appropriate Screen Time



S: Synchronous learning
A: Asynchronous learning
O: One-on-One Sessions



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ABOUT FICCI

Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies. A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies. The chamber with its presence in 14 states and 10 countries, provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

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