Economic & Social Impacts of Online Learning in Higher Education: Building Resilience

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India's higher education (HE) system is the world's largest. Still, Indian HE gross enrolment ratio (GER) is only 26.3%, just above the world average of 24%, and far lower than in other Asian countries like China (51%), South Korea (94%) and even in Malaysia (45%) and Indonesia (36%). COVID 19 and factors like increasing HE fees, and contemporary skill required by the industries; the challenges facing Indian HE institutes (HEI) are enormous. Online education has come as a blessing in disguise in the current disruption scenario. This article shows how the economic and social benefits of online courses would help HEI in developing resilience. It also elaborates on how an HEI can get online strategies right, through faculty and student engagements and taking care of security issues and making ecosystem partners like industries work together.

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Introduction

Indian higher education (HE) sector constitutes approximately 40,000 colleges and 993 universities, which makes it the world's most extensive higher education system. With 37.4 million students registered in higher education India stands second in terms of student enrolment. In FY19-20 India's education sector was of the size of US$ 101.1 billion (IBEF, 2020)

India is the second-largest market (first being the USA) for e-learning, about US $ 1.96 billion in 2020 and 9.5 million users recording a 41 percent CAGR between 2016 and 2021 (IBEF, 2020).

Government of India is investing in a big way in online education as India targets to reach 30% Gross Enrolment Ratio (GER) in higher education by 2020-21. In 2004-05 Indian GER in higher education was only 26.3, just above the world average of 24% while in other Asian countries it was significantly higher, like in China 51% and in South Korea 94%. Even Malaysia and Indonesia had higher GER, 45% and 36%, respectively. The USA has

a GER 88% and Germany's is 70%. (AISHE, 2019)

HE costs are high, and students from low-income families cannot continuously come to the college for studies as they must do a part-time job to make two ends meet. COVID -19 has been a massive disruption for the education sector. "The global crisis with the spread of COVID-19 is not only creating havoc on the health of people, global economies but also having a devastating impact on education system due to closure of universities, colleges and schools around the world." (Association of Indian Universities, 2020). Due to the extended closure of schools and colleges, the accessibility of education to the students has reduced. As per UNESCO, nationwide closures have impacted almost 70% of the world's student population (UNESCO, 2020).

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Hence the question arises as to how can the education sector rebound and give education to all? What are the steps the education sector needs to take to build resilience? As per Association of Indian Universities (AIU) "the preparedness of the Indian universities in imparting online quality education to Indian students amid COVID-19 crisis is limited." So, what should Indian universities do so that they can enhance their preparatory levels? To answer these questions IIM Indore along with Technical Education Quality Improvement Program (TEQUIP -III of MHRD) has undertaken exhaustive and in-depth research on online teaching in technical HE institutes and came out with strategies for building capabilities in HE institutes.

Technology Usage in Education

According to UNESCO, education institutes need to gear up for the delivery of educational services online. Online learning delivery of content will reduce the losses of academic learning and help the industry develop resilience (UNESCO, 2020). In May 2020 Finance Minister (FM) announced that Technology-driven education to be the focus. FM launched the PM eVIDYa program for multi-mode access to digital/online learning. Top 100 universities, as per NIRF ranking, were permitted to automatically start online courses. The government has launched many initiatives of online classes in urban and rural areas. SWAYAM (https://swayam.gov.in/about) is the most successful Government of India initiative on online learning. The courses learned through the SWAYAM platform can be used as credits and are allowed to be transferred to the academic record of students.

Technology usage can help India improve the quality of teaching and launch skill-based courses. It is expected that if Indian HE uses technology interventions the economic impact would be in the range of $60 billion to $90 billion per year by 2025. The usage of Information and Multimedia Education Technologies will help HE institutes in providing better edu-

Table 1 Digital India

Particulars	2019	2025
Total Wireless Subscriptions	1,173.75 Million	1497 Million
Total Internet Connections	687.62 Million	1198 Million
Total Wireless Data Consumption (Annual)	68000 Petabyte	148635 Petabyte
Data Usage per Wireless Data Subscriber per Month (Average)	10.37 GB	24 GB
Cost of Data per GB (Average for Wireless Data)	INR 6.98	INR3.8
Market Value of Core Digital Services Industry	$ 200 Billion	$ 710 Billion
Smart Phone User Base	354 Million (29% of mobile phone users)	1100 Million (40% of mobile phone users)

Source: IAMAI (2019)

cation to students, which is resulting in higher productivity to industries by giving more skilled workers. (Mckinsey, 2020)

Higher Education Institutes & Online Teaching

For developing strategies in the post-COVID-19 landscape first, the industry needs to understand how the disruption has affected them and their value creation partners. PricewaterhouseCoopers (PWC) came out with five primary challenges affecting industries due to COVID-19 viz., Asymmetry, Disruption, Age, Populism, and Trust. These five challenges post-COVID -19 have a profound impact on the Indian higher education sector (PWC, 2020) (Table 2)

The HE sector needs to reconfigure itself to manage these five challenges. Technology that does not require social distancing like automation of jobs through AI and robotics will accelerate. As elaborated by PWC in their research on new technologies, "To a degree, reconfiguration also means jumping on the trends that have suddenly gained currency in response to the pandemic, including telemedicine, distance learning, and remote working." HE sector has to redesign itself using technology.

Online teaching is the reconfigure strategy for the education industry in India.

Online teaching is the reconfigure strategy for the education industry in India. Massive open online courses (MOOCs) have revolutionized HE and school education as it has reached millions around the world. (IBEF, 2020). By April 2020, 16 million new customers joined Netflix. This number was twice Netflix added by Dec 2019.

HE faces three challenges, first, only six in ten students join for a four-year undergraduate course graduate within the stipulated time; second, most employers are not happy with the skill sets graduates come with. and third, tuition fees have risen far faster than inflation or household earnings for two decades. (NPR, 2019). The new way of teaching

Table 2 Reconfiguration Strategy HEI

Challenges due to Covid-19	Asymmetry	Disruption	Age	Populism	Trust
Definition	Wealth disparity and the erosion of the middle class	Abrupt technological changes and their destructive effects	Demographic pressures as the average life span of human beings increases and the birth rate fall	Growing populism and rejection of the status quo, with associated nationalism and global fracturing	Declining confidence in the prevailing institutions that make our systems work
Effect	• The crisis will hit poor people, poor regions, and developing countries hardest • Unemployment at the bottom of the wealth pyramid will grow • Small businesses will fail on a massive scale	The pervasive nature of technology and its impact on individuals, society, and the climate	• Fewer opportunities will be available for young workers • Pressure on pensions and social welfare systems will increase • Developing markets will struggle to stimulate job creation	Economies will become more localized owing to the reconfiguration of supply chains	•Declining confidence in the institutions that underpin society • Distrust in institutions' ability to respond fairly will grow
Challenges for Higher Education	Develop cost-effective teaching pedagogy. Students will be working to make two ends meet hence classes any time anywhere would be the norm	Use contemporary technology and launch skill-based courses	Specialized programs and skill development programs will able to make employable graduates	Localization and customization of delivery	Safety and secure online teaching, transparent fees, and clear process of course credit.

Source: Developed by author using PWC (2020) framework

and learning, coupled with employers' growing frustration with the skills of graduates, will catapult online courses to new heights, and these online skill development courses will be a big competitor for traditional college degrees. (BCG, 2014)

Online teaching, if done correctly, will give fast, consistent, high-quality content with measurable output to students more quickly.

Online teaching, if done correctly, will give fast, consistent, high-quality content with measurable output to students more quickly. The online revolution in learning is exploding. Coursera has more than 2.7 million registered students. Online studying has become impressive with online courses now has video lessons, embedded quizzes, instant feedback, and student-paced learning. Harvard University and the Massachusetts Institute of Technology (MIT) — edX—offers and SWAYAM offers impressive online experiences. To summarize, online studies will benefit the HE sector in two significant ways, 1) increase enrolment due to affordable online courses and student-centric learning, thus increase in gross enrolment ratio and access to marginalized groups and 2) the industry will get focused, skilled labor force.

Research Findings

To find out how is online teaching affecting Indian higher education institutes (HEI), Ministry of Human Resources through TEQIP-III, and Indian Institute of Management Indore IIM did an in-depth survey of engineering and management colleges across India.

The significant findings were as follows:

- 60% of heads of institutes opined that online learning would get access to new markets.
- 82% of them agreed that online learnings would be economical, cheaper/ affordable for candidates.
- 78% of them agreed that online education would help in increasing GER
- 72% of them agreed that poor students get access to online learning
- 58% of them agreed that students could take part-time work or industry assignments while studying
- 69% of the heads of institutions said that faculty non-cooperation/ faculty reluctance is the biggest issue in launching an online program.
- 62% of heads of institutes have mentioned online security issues as a threat to online education.
- Technology, finance, and availability of materials were not the major issues for the institutes. 32% mentioned the availability of online reading materials to be a challenge.

Economic Effects of Online Teaching

The economic impact of online courses is enormous. As seen in our sur-

vey results, 82% of heads of institutes felt that the cost of education will reduce through online classes (Table 3). Due to online or modular teaching for government college students, there would be a 33 % saving, and for private colleges, there would be 13% to 16% saving for students. The program fees will also reduce by approximately 15% to 22% if the program is delivered online or modular.

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Table 3 Cost in % of Technical Higher Education

B. Tech/BE	The program fee of offline	Other costs
Government College	66.10	33.90
Grant in Aid	86.85	13.15
Private Institutes	84.00	16.00

Source: AICTE Note 2018, Program fees include fees and books. Other costs include stay, transport, and other expenses.

BCG research in USA HEI found that the students save $12 to $66 per credit hour compared to offline courses. The total saving comes out to be 3% to 50% of the average credit hour costs. (BCG, 2014). 26% of MBA college enrolment at the University of Massachusetts Amherst is online and gives 40% of revenues. American universities have changed their rules where students can take 25% of their credits through online courses. Georgia Institute of Technology launched a fully online MS in Computer Science with an enrolment of 401 students. These examples show that quality education can go online as well as it gives enormous revenues to the institutes (BCG 2014; André Dua, 2013)

Students going through online courses have higher retention rates. These students also graduate faster. Research by Arizona State University found that students experienced graduation rates improvement, increased access, and up to 50% cost savings due to online courses. At the University of Central Florida (UCF), students who took 41 to 60 percent of their courses online finished earlier, in 3.9 years on average, than students who received no course online, with an average of 4.3 years needed to graduate. (Joshua Bolkan, 2018). The economic impact of online education is positive as it helps reduce costs for the students, increase revenues for the institute, and simultaneously improve the government in increasing GER.

Social Benefits of Online Courses

There are numerous reasons for college dropouts of disadvantaged sections in India. The primary reason is that the parents are not interested in their children's HE as they feel college-going hampers other economic activity /work for wage /salary, the college is far off and it is costly to travel long distances for education. For women students, the

reasons for dropouts are looking after younger siblings, attending domestic work, financial constraints, and timing of educational institutions is not suitable. (Rout, 2015).

As per our survey 58% of the institutes agreed that students could take part-time work or industry assignments if they mix online and offline courses. This means that poor students can continue with their education. The primary reason for college dropouts in India is due to financial constraints, and parents from low-income families feel that higher education is not essential to earn a living. Online courses or modular courses will help the students from poorer families can work as well as study simultaneously. Industries have said that those skill development courses which use online and combination of factory internship helps in getting the right skill workforce for the industries. Firms like Bharat Forge, Tata Steel, Maruti have embraced the modular (online and factory training) for disadvantaged sections of society.

Support Faculty

"Faculty should receive the support required to continue their research and to learn how to teach effectively in an online environment" points out a US Government report on education resilience. Institutions that cultivate a culture of improvement will benefit both their students and their faculty. Institutes should do the online training for teachers and help them adapt to the changing pedagogical ways. For motivating teachers and enabling them to share their best practices institutes should use social media and online forums. Using remote teaching practices, having meetings on technology platforms will help in developing experience and will reduce the fear in the faculty of using online platforms. It has been proved that the culture of sharing and improving increases when faculty fear of using new technology decreases. In our survey 58% of the faculties asked for online teaching training and experience.

Institutes are required to develop a sense of improvement.

Institutes are required to develop a sense of improvement. In remote teaching, it is natural for a faculty to feel uncomfortable, and they start teaching using their initial skill levels and comfort levels. Hence an HEI needs to make the faculty feel essential and allow them to take risks and learn. Institutes need to cultivate a culture of improvement. As US universities are embracing online teaching post-COVID-19, many have said that the feedback generated in the first online teaching course will not be used for evaluation or promotion. This reduced the threat perception in the faculties, and they became more committed to the change.

Institutes need to develop a process, peer learning, and organization structure wherein a faculty can get regular feedback on their remote teaching. The full process should be seen as an improvement process, not as a controlling process. Institutes can use Pradhan Mantri GraminDigital SakshartaAbhiyan

(PMGDISHA) 0.26 million training centers to train disadvantaged students in digital literacy. This would help in the successful transition of students to online studies.

Security

Cybersecurity investment is critical for online teaching and learning. Cyberattacks have disrupted online classes. HE Institutes need to develop cybersecurity teams (CST). CST needs to study how attackers can attack their institute systems and develop strategies to close the gaps. Institutes need to budget the investments in security and data privacy. The dedicated CST needs to continually monitor remote-learning platforms, tools, and networks for malware. Continuous monitoring at institute, faculty and students levels will help to catch data-related incidents before they become serious problems. Faculties and students need to be educated about phishing and malware attacks. McKinsey came out with the following security and technology risk actions to support online learning:

"Secure the tools used for teaching and learning by implementing safe remote-learning protocols including scaling virtual private networks (VPNs) for data transmissions by students and faculty, implementing multifactor authentication for learning applications, enforcing antivirus software, limiting access to learning applications to the verified student and faculty members, and ensuring adequate cloud storage for recorded lectures. Example: Yale University's IT department has created a coronavirus technology update service that highlights VPN and multifactor authentication protocols, as well as supporting online learning." (Mc Kinsey, 2020)

Conclusions

Indian HE can develop resilience and bounce back to normal by first creating a portfolio of online courses looking at their internal capabilities and marrying these capabilities with market requirements. HEI needs to provide support like a network of remotely accessible support structures that students need to succeed fully in online learning. HEI needs to engage faculty as co-creators in digital learning. Faculties need to be administered training on online teaching and new pedagogical tools. HEI needs to understand that online education is not a stopgap arrangement. It is an activity that is going to last for a long time. Hence, they need to invest in the infrastructure necessary to ensure lasting impact.

There is much positiveness of online classes, but the most significant bottleneck is the internet and devises availability, which is compatible with seamless online studies. Only half of the Indian households have access to the internet and own a computing device. Conservative estimates show that 12.5% of the households of students with online teaching compatible devices in India have internet access at home. Government and private firms should work at a faster speed to deliver the internet and equipment to every citizen in India.

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