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A Critical Study of Impact of COVID-19 on Online Learning

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ABSTRACT

A qualitative content analysis research was carried out to study the impact of pandemic-ally spread Coronavirus on Online Learning Platforms for tertiary education level employing various tech-savvy applications and e-platforms. This study reviewed around 150 published studies and research on online media since December 2019, primarily focussing on assorted universities that have exercised virtual learning platforms in the form of videoconferencing (podcasts or webcam videos), webinars, Audio Conferencing, Live streaming applications, e-Workshops, e-Conferences so on and so forth during COVID-19. It has swamped nearly all the sectors of the economy affecting entirely, the social class pyramid simultaneously damaging the business, marketing and its services to its population. The purpose of this study is to evaluate as to how education sector manifested temporary reforms and has been able to cope-up with ongoing widespread disease by transcending towards content delivery to learners, students and readers nationally and internationally.

KEYWORDS: *COVID-19, online learning, pandemic, Web 3.0, e-learning, Learning Management System (LMS), digital learning, Higher Education (HE), University Grants Commission (UGC)*

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1. INTRODUCTION

"Empowerment comes from within,
Nobody else can give it, Except the Almighty."
-A.P.J. Abdul Kalam

COVID-19, a global life threatening pandemic disease not only destroyed the careers but also obliterated all hopes and happiness that people managed to cling to during the disease outburst. Coronavirus has affected 210 countries and 2 international conveyances[1] resulting the public to shackle themselves from their neighbourhood and public places. The number of coronavirus cases has risen up to 217,759 as on June 5th, 2020. This epidemic has proved to be fatal for various sectors of Indian Economy majorly disturbing and destabilizing the manufacturing sector. Similar effects has been seen in travel and tourism, aviation, Electronics, IT, Shipping, Textile and above all Education sector which has been disrupted drastically. The education in schools, colleges and universities are facing unprecedented challenges. However, in order to combat the prevailing situation and take preventive measures, Indian Government has provided several guidelines restricting the movement of people and social distancing. To cope up with community-wide spread, for higher education students, UGC and other apex educational bodies and authorities have devised and issued COVID-19 guidelines for Indian Higher Education Institutes (HEIs) resulting in temporary closure of about 1000 universities and 4o,ooo colleges with an efforts to encourage online learning platforms. The abovementioned measures to climb out of despair and depression among the students, online education trajectory will observe nearly 3.75 crore students enrolled in and 14 lakh faculty employed by the system[2].

Functionally, online learning is of two types: 1.Synchronous (learning that takes place collaboratively and at the same time with a bunch of online learners and usually a mentor/teacher) 2.Asynchronous (learning that takes place at any time, not necessarily in a group, but with teacher feedback). Therefore, blended learning is required as a strategic tool to remove hindrances in the journey of learning and conceptualizing. By doing this, many entities also tried to discover and re-discover ways for adaptive and fast-thinking learning ability. **Table No. 1 of Annexure I** depicts various strategies that are used in blended learning like various activities and nature of learning (synchronous or asynchronous) applied.

2. Review of Literature

2.1. Pandemic

(Harris, 2000) The internationally accepted definition of a pandemic as it appears in the Dictionary of Epidemiology is straightforward and well-known: "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people". The classical definition, however, includes nothing about population immunity, virology or disease severity.

(Morens et al., 2009) Modern definitions include "extensive epidemic", "epidemic over a very wide area and usually affecting a large proportion of the population", and

"distributed or occurring widely throughout a region, country, continent or globally", among others. In the case of influenza, biologists also require that pandemic strains undergo key genomic mutations, known as antigenic shift. **(WHO, 2011a)** For WHO to pronounce a level six pandemic alert there has to be sustained transmission in at least two regions at the same time. WHO's standard definition of pandemic influenza refers to a situation in which a new and highly pathogenic viral subtype, one to which no one (or few) in the human population has immunological resistance and which is easily transmissible between humans, establishes a foothold in the human population, at which point it rapidly spreads worldwide.

2.2. Online learning

(European Commission, 2001) EU has described new multimedia technologies and the Internet in a way to enhance the quality of learning by simplifying and comforting the basic access to facilities and services as well as distant exchanges and collaboration.

(Dublin, 2003) According to him, e-learning tends to reveal the specialization and interest of the researchers.

(Joy, 2004,) Webinar: A seminar which is conducted over the World Wide Web. It is a type of web conferencing. A webinar is "live" in the sense that information is conveyed according to an agenda, with a starting and ending time.

(U.S. Department of Education Office of Planning, Evaluation, and Policy, Development Policy and Program Studies Service, 2010) The term does not include printed-based correspondence education, broadcast television or radio, videocassettes, and stand-alone educational software programs that do not have a significant Internet-based instructional component.

2.3. Studies depicting impact of pandemic situations on education and learning

Many worldly calamities shook the education system and convicted growth and development months and years. What-so-ever the situation became, Government's been dutiful to respect Right to Education. Large-scale unexpected events has been given an umbrella term that is, "Black Swan" commonly represents a rare event that people don't anticipate but has been found to have profound consequences like pushing educational innovations during uneventful periods, from being largely peripheral towards decentralization of learning and educating. Likely measures were taken during the following outbreaks: 1) H1N1 Influenza virus; 2) SARS outbreak in 2003; 3) The Swine Flu, which afflicted in Mexico in 2009; 4) Bird Flu, an earlier outbreak in China, and 5) Ebola virus. Since then, many educational reformers have recognized the need of Web 3.0 to bring an advanced levels of ICT (Information and Computer Technologies) as a sort of '*Trojan horse*', from which educational innovation may spring inside traditional education systems. As an affirmative and corrective action Mexico, during swine flu outbreak diverted towards *Telesecundaria* program and China, during bird flu resolved the problem of delivering learning facilities via television streaming "Classroom on the Air" program. Similarly, Asian countries affected by SARS, turned to virtual instruction. To combat effects of COVID-19, China's Ministry of Education fixed learning problem by uploading K-12 courses to a national online database.

2.4. Need and Significance of Study

It is imperative to understand the repercussions of Novel pandemic COVID-19 selectively on online learning among the tertiary class of education. Various factors that attribute towards the need of this study are: 1) Whether the bane of virus may prove an ultimate boon to help bridge the digital divide; 2) New learning modalities among traditional in-person classroom learning; 3) Discovering the need of Ed-Tech and Distance Learning; 4) Benefits and Challenges of remote learning; 5)Coping-up strategies of different universities to address millions of students at distant locations at same time in Indian context; 6) Future of e-Learning for higher education in India and 7) Ensuring privacy and data protection of various establishments like colleges and universities. There is a considerable need to determine tactical strategies that several colleges and universities are assimilating being in limelight with their leadership approach keeping them upfront to still maintain interaction with their learners while still navigating the contagion-driven situation and to foresee their dedicated agendas in providing continuously, the higher quality of learning.

2.5. Objectives

A. To understand the nature of Indian colleges and universities during COVID-19
B. To develop a theoretical analysis of the crisis management in Indian Education System with reference to Higher Education (HE).

Methodology

Research Design

The research methodology for this design was to review published studies and sources (who.int), newspapers (economictimes.indiatimes.com), Government websites (corona.mygov.in; worldometers.info), and podcasts (cnn.com; npr.org; deccanherald.com), the range of which included literature reviews **prior to 2008** and **empirical research after 2008**. For purpose of this study, online learning or online education is functionally defined as a layout or format that remodelled from "black box" to "cognition and competition". The terms like online learning, online education, virtual learning, online media and platforms are used interchangeably throughout the paper.

Selection Criteria and Sources of Data

The key literature sources were the Press Trust of India (PTI)-newspapers resources and the articles including blogs et cetera. Secondly, formal reports were studied to understand the technical impact of COVID-19 on the education sector in India including reports from KPMG, McKinsey, WHO, UNICEF that helped in deriving authenticated conclusions with its data analysis. The major portion of secondary data has been collected from the ordeals of Government online meetings, press reports and reliable facts from e-News constituting national e-papers like The Times of India, The Hindu, and Business Insider so on and so forth. To expand the search description further by collection from several sources, certain empirical data was also recorded to understand the oligopoly of e-learning marketing applications within India and the user network escalation.

Data Analysis

During the initial review of literature, various established and laid out definitions and meaning of the concept 'online learning' and 'pandemic' were studied to form a cornerstone to my study of this paper. Various themes were categorized adhering to the theoretical framework developed by **U.S. Department of Education Office of Planning, Evaluation, and Policy, Development Policy and Program Studies Service**, which emphasizes on online learning constituting broadcasting (TV and radio), video conferencing, educational software programs and print-based correspondence education which fulfils the requirements of web-based technologically. The findings were organized further into three major themes answering my research questions, the state-wise universities or colleges that adapted to rampant technology swiftly to override halts in learning process, an insight on the competitors providing online education, and understanding the nature of the Indian Crisis Management as a resolution towards COVID-19. According to **Figure 1 of Annexure II** given by UNESCO, nearly 34,337,594 tertiary education students in India have been affected by the abrupt decisions of shutting the colleges and the universities.

Finding

It has been observed that numerous State Universities, Central Universities, Colleges and by far institutes have modulated their practices during COVID-19 by positioning themselves on the technological approach embodying variety of e-platforms for unstopped delivery of lectures and learning activities. A detailed list of those universities and the e-platform that they devised is given in **Table No.2 of Annexure I** that puts forward resolution of the institutes towards the pandemic along with the source of information, so collected. However, these are just some selected number of education centres and a variety of other colleges are working towards bringing actively their students towards new wave of learning opportunity. Hence, a collaborative way has been resolved for distance education and remote learning.

Role of Government

The main objective of the Government is to continuously provide full access to online classes using digital learning platforms Some of the initiatives as launched and executed by the government are as below and **Table No. 3 of Annexure I** represents the National Partners along with the Level of Education (Authorities) of India.

1. **Swayam** : States 'Study Webs of Active–Learning for Young Aspiring Minds', it is a varied regional languages initiative. It has been formed for those students are continuing their education from class 9th to 12th and those who aspire to be under-graduate or post-graduate. The content to be provided in electronic format only.
2. **Swayam Prabha-** A group of 32 DTH channels using GSAT-15 transponders telecasting the channels 24*7. The significance of the telecast is contents are streamed everyday for duration of at least 4 hours plus the same content is repeated 5 times a day. It is a user friendly but one-way communicative medium.

3. **Other e-Platforms are**:

A. **National Academic Depository** (NAD): Facilitated by MHRD, and executed by UGC associated with around 55 school boards, 359 state universities, 123 deemed universities, 47 central universities and 260 private universities.

B. **National Digital Library of India** : This platform also run by MHRD affiliated under National Mission on Education through ICT (NMEICT) for both school level, higher education and even Ph.D. level education. NDLI has over 4.8 crore content in more than 300 languages that can be viewed in 60+ formats apart from e-Books (audio books, simulations, e-Thesis, question papers et cetera.)

Note: A recent addition on NDLI has been a special module named "Corona Outbreak: Study from Home" with a collation of wide range of digital content.

C. **Virtual Labs**: It is a key initiative under the mentorship of NMEICT, a consortium of 12 IITs aiming to disburse online classes and is resourceful via 700+ virtual experiments

Crisis Management

During COVID-19, not all business has been shut down. As there are certain occupations that have customer interaction, production deliveries and team tasks that eventually required workforce to complete assigned tasks. It includes interns, ongoing project teams, science lab researchers, biologist, medical transcriptionists etc. All business verticals and geographies have been reeling under the impact of the global pandemic, but these services were continued for running necessary e-businesses reducing the time of dispensing services throughout. Some online platforms like Coursera, the company scaled up their operations before they made their platform free in order to take the load of extra users. This well explains the advance crisis management with a vision the company had foreseen. And later that proved fruitful as a strong response was received by the college students of over 500 campuses with primary courses related to data science, business and technology has been severely sought-after. The students after the platform became free for access also offers the articles and courses of other college and universities to the students free of cost from any college to any college which were earlier open via paid subscriptions only. And with the shutdown enforced by the Indian government to control the spread of coronavirus, the education system in India is undergoing a paradigm shift. Much of the country's $180 billion education sector is going online to adapt to the new reality. Poised to reach USD 1.96 billion by 2021, India has a current user base of around 9.6 million. **Table No. 4 of Annexure I** represents list of free Education and Learning Services especially given away during COVID-19.

Case Study 1: Response of Uttar Pradesh HE Department towards COVID-19 (-by Business Insider, April 17, 2020)

- Teachers from various state universities and colleges prepared 65,943 e-contents that are available on the respective university/college website in PDF format, PPT and AV recordings, all continuously being monitored by the VCs of the respective institutes.
- 223,930 online classes on different subjects have been already conducted since the lockdown by 10,087 teachers of various state universities and colleges; attended by an average of 144,431 students per head.
- 4,667 teachers conducted various online courses and published 2,823 research papers, books, 1989 online

meetings and 1462 online training programs have also been organized by these universities and colleges.

Case Study 2:

- The case study of Madhya Pradesh is in **Table No. 5 of Annexure I** which exhibit records of various universities and colleges of Madhya Pradesh that responded towards e-Learning mediums during COVID-19 with the e-notes provided and content uploaded for students and learners.
- It gives information of various state universities and colleges that produced e-content and the number of curriculum e-files during lockdown effectively and kept the learning ongoing for their students.

Summary

India, coped well for continuous learning opportunities for students by giving out curriculum and e-conference information and engaging all the faculty and administrative staff virtually. Renowned Universities and Colleges used various platforms to address the subject matters. While many of them have been shared in **Table No. 2 of Annexure I**, state-wise inititiatives are expressed in **Table No. 6 of Annexure I**. Table 5 give away information on various online platforms that various states maximally used to connect with the learners and the students along with the faculty members.

Future of e-Learning

To combat the existential crisis of this global pandemic, **Figure 2 of Annexure II** describes model that will lead a better way to understand the working of Higher Education in India to safeguard the academic calendar while still maintaining the lockdown instructions. The model is devised by McKinsey and Company for sustained education industry demonstrating a framework for COVID-19 integrated nerve centre exhibiting areas of responsibility. Future of e-learning can be described as follows:

1. **Future of e-learning and digital education extracted**: Promote **push and pull** strategies towards hybrid learning during COVID-19, therefore enhancing affordability criteria and bandwidth for rural community. **Democratization** or Digital Transformation including internet activity, telecom infrastructure, affordability of online system, improved standard of living and availability of laptop/desktop etc. **Breach of confidentiality** related to safety and security of information shared on screen of all users.
2. There are various strategies that a teacher may adopt and that includes Problem Based Learning, Flipped Classroom, Project based learning, Process Oriented Guided Inquiry Learning (POGIL), Inquiry based learning, Technology based learning, Research Based Pedagogical Tools (RBPT) etc.
3. **Feedback v/s Feed-forward technique**: While feedback give suggestions to improve a particular process telling learners how to improve on their assignment, feed-forwarding on the other hand is future-focussed indicating ideas what a learner teacher can do differently with the assignment.
4. **Guide Teacher Performance: During e-Teaching, teacher has to devote their undivided attention to creatively design the on-line learning plans following which classes are open to public and parental scrutiny that will make their conscious of delivering at par the best in online class. Hence, focused intervention would duly remove the learning gaps**
5. **Investing in Cyber-security**: To ensure undisrupted and undisturbed classes, universities need to essentially have made investments to pivot data encryption and enabling safe teaching programs. E.g. Scaling Virtual Private Networks (VPNs) for data transmission.
6. **Activate stakeholders:** Private or public, big or small, to sneak into the virtual world, key transformation required is to empower and deploy the remote teaching talent with its most pressing needs.
7. **Focus on access and equity**: Promoting loaned equipment, procuring additional laptops and hotspots for under-resourced students at faster and accessible cost, removing data caps and particular attention to students with learning disabilities or accessibility needs (visually, aurally or tactilely accessible problems)
8. **Evaluation of learning** which includes a formative (Intra Semester Assessments -ISA), and a summative assessment (Semester End Assessments- SEA). Academic autonomy can be granted to particular state Colleges, permitting flexibility in adopting different modes of assessments. For example, Formative assessments may include assignments, multiple choice questions(MCQs), Gobbets, problem based learning activities, quizzes, short answer questions (SAQ), mini projects, practice presentations, kinaesthetic assessments, reviews, project based learning activities, case studies etc.

Suggestions

A. For Faculty Members

1. **Innovate Ways**: Sharing of files (document, presentation, video link etc) offline and discussion about the same or in assignment format will keep the interest going. Therefore, use blended learning for virtual goals.
2. **Addressing Teams**: One of the effective tools can be to make teams of large number of students by dividing them and allocating different activities. Usually it becomes difficult to manage large chunk of students virtually losing decorum. This way, the representation may be aligned with rest of the teams following an evaluation.
3. **Online Record**: A database in Word or Excel is always advisable to be maintained weekly or twice a week or so on to discuss pre-determined topics and marking virtual class participation. This will improve the outcome of each and every student realising and considering it to be an online attendance.
4. **Offline interactions**: Despite availability of platforms like Zoom, WebEx, GoogleMeet, etc it important to have contact with selected students via formal group messages and E-mail to engage the students out of online virtual network. This will not cease communication among distance learners as well along with maintaining record of all the content shared thereof.
5. **Fixed hours**: Always try to pin to particular hour for interaction so that students are aware and determined to appear at the time discussed before. It may be a particular day of the week or time. This will benefit both as many faculty members will be able to manage household chores and the professionally bridge gap due to lost physical connection.

B. For Students

1. **Recorded Contents:** During infrastructure problem, weak signals, log-in problems student CAN access the content of the recorded live conferences and work at their own pace. But it is necessary to have communication with the respective mentor about the class not attended to not lose contact with the rest of the students and teacher.
2. **Understanding Constraints**: It is important for students to familiarize themselves with various hurdles of using E-platforms especially those who are not tech savvy. This includes a prior homework on famous web applications like Zoom, webex, etc and watching their tutorials on their usage. This will help save interaction time.
3. **Avoid & Block Distraction**: One-Application-at-a-Time approach is necessary ingredient in learning process by creating learning schedules. Some blocker apps may be used like SelfControl, FocusMe, Freedom etc, a way to increase productivity.
4. **Track Self-Progress:** Via to-do list, use task trackers like Notion, Trello to do things right and record achievements, be it virtual ones.
5. **Active Participation:** Follow-ups, feedbacks, suggestions will enhance interaction for both parties or monotony is bigger loophole than conveying and improving process.

Annexure I Tables

Table 1 Strategies used in Blended learning

ACTIVITY	SYNCHRONOUS	ASYNCHRONOUS
Collaborative writing or story-making	X	X
Content production (word processing, spreadsheets, etc)	X	X
Discussion forums or text-based chats*	X	X
E-portfolios		X
Games/gamification*	X	X
Intelligent tutoring (online teaching and assessment tools, often subject-specific)		X
Live video chats*	X	
Multimedia presentations	X	X
Online drawing and drafting		X
Plagiarism checking (using anti-plagiarism tools that provide feedback to writers)		X
Quizzes and surveys*		X
Video chatting and conferencing*	X	
Video creation and sharing*		X
Virtual gallery walks (there are special sites and software for these)	X	X
Virtual reality scenarios (sometimes requires special software)	X	X

Source: https://www.ibo.org/globalassets/news-assets/coronavirus/online-learning-continuity-planning-en.pdf

Table 2 Higher Education Institutes' on-going resolution to COVID-19

S. No	University/College; Place	e-Platform during COVID-19	Source of information	Dated
1.	Amity University, New Delhi	Mercer | Mettl's assessment technology Amizone (Intranet)	India Today Web Desk Business Line	14th April, 2020 24th April, 2020
2.	Bennett University, Greater Noida (Uttar Pradesh)	Mercer | Mettl's assessment technology	India Today Web Desk	14th April, 2020
3.	IIM Bangalore	Mercer | Mettl's assessment technology	India Today Web Desk	14th April, 2020
4.	Ashoka University, Sonipat (Haryana)	Mercer | Mettl's assessment technology	India Today Web Desk	14th April, 2020
5.	Indian Institute of Technology (IIT), New Delhi	Google Hangouts	The Print	24th March, 2020
6.	Jawaharlal Nehru University (JNU), New Delhi	Google Hangouts	The Print	24th March, 2020
7.	Shiv Nadar University, Greater Noida (Uttar Pradesh)	Blackboard Microsoft Teams	The Print	24th March, 2020
8.	Delhi University, New Delhi	Google Classrooms Google Hangout Webex Skype	University of Delhi (du.ac.in) The New Indian Express	- 31st March, 2020
9.	NIIT University, Neemrana (Rajasthan)	Adobe Connect Zoom	Livemint.com	23rd March, 2020
10.	Reva University, Bangalore	Microsoft Teams Zoom	Higher Education Digest	31st March, 2020
11.	Deshbandhu College, Delhi University, New Delhi	YouTube Google Classroom	Outlook e-Magazine	22nd April 2020

12.	Sharda University, Greater Noida (Uttar Pradesh)	Big Blue Button Zoom Google Classroom	Outlook e-Magazine	22nd April 2020
13.	Chitkara University, Himachal Pradesh	Aarogya Setu App	Chitkarauniversity.edu.in	
14.	IIT, Mandi, Himachal Pradesh	Moodle Course Management System	India Today	14th April, 2020
15.	North-Eastern Hill University, Shillong (Meghalaya)	1)Central Library e-Resources (e-Journals, e-Databases, e-Books) - INFLIBNET Initiatives 2) Bloomsbury: (till May 2020) -Architecture Library - Collection e-Books platform - Cultural History	Nehu.ac.in	
16.	Indian Institute of Technology (IIT), Kharagpur (West Bengal)	WebEx YouTube Live(using National Knowledge Network) NPTEL (Video lectures) National Digital Library of India (NDLI) Zoom, G-suite, Skype DEEKSHAK (an IITKGP web-conferencing platform)	The KGP chronicle	30th March, 2020
17.	Maharaj Lakshmishwar Singh Memorial (MLSM) College, Darbhanga (Bihar)	-Facebook Livestreaming	The New Indian Express	6th April, 2020
18.	National Law University, Delhi	-open Massive Open Online Course (MOOC)	Business Standard	1st May, 2020
19.	Shivaji University, Kolhapur (Maharashtra)	-NEAT Portal	Unishivaji.ac.in	
20.	Galgotias University, Greater Noida (Uttar Pradesh)	-Zoom, Moodle, Google Classroom, Google Hangout, WebEx, Skype, Virtual labs -Online Seminars and Masterclass E-resources: NPTEL, SWAYAM, UDEMY, COURSERA, MIT	The Times of India	23rd April, 2020
21.	Bangalore University, Bangalore	-Zoom (90%) -Skype,Google,Cisco and WebEx	Bangalore Mirror	2nd April, 2020
22.	Gujarat Technological University (GTU), Ahmedabad, (Gujarat)	-Facebook Live -Google Classroom -WebEx -Zoom	The Indian Express	19th March, 2020
23.	Guru Nanak Dev University (GNDU), Amritsar (Punjab)	-Moodle -Zoom -YouTube -WhatsApp -Online Platforms: SWAYAM, NPTEL, NEAT	The Tribune (Tribune News Service)	31st March, 2020
24.	University Business School, Ludhiana (Punjab)	-Zoom -WhatsApp	The Times of India	6th April, 2020
25.	Khalsa College for Women, Ludhiana (Punjab)	-Digital tools like Dropbox, Google Drive, Google Groups -YouTube, WhatsApp -Google Forms	The Times of India	6th April, 2020
26.	Sri Sairam Engineering College, Chennai (Tamil Nadu)	-Webinars -Google Classroom -Online faculty development programs	The Times of India	1st May, 2020
27.	Dr. Ambedkar Law College, Chennai (Tamil Nadu)	-Google Classroom -YouTube channels	The Hindu	23rd April, 2020
28.	Panjab University, Chandigarh (Chandigarh)	-Google Classroom -Skype -WhatsApp -NAPTEL	Collegedekho.com	27th March, 2020
29.	Goswami Ganesh Dutta Sanatan Dharma College, Chandigarh (Chandigarh)	-LX Module	Hindustan Times	3rd April, 2020

30.	D.A.V. (P.G) College, Dehradun (Uttarakhand)	-NDLI -Zoom -Microsoft Teams -Skype	NDTV (PTI)	18th April, 2020
31.	K L University, Vijayawada (Andhra Pradesh)	-Microsoft Teams -Zoom	ET Government	18th March, 2020
32.	St. Stephen's College, New Delhi	-Google Classroom -YouTube(video lectures)	The New Indian Express	31st March, 2020
33.	Parvatibai Chowgule College, Margao (South Goa)	-Google Classroom -Hangout Meet -Go To Meeting -SWAYAM -INFLIBNET	Herald- The Voice of Goa	12th April, 2020

Table 3 National Partners and Level of Education

S. no.	Level of Education	Partners
1	Undergraduate Course	AICTE, CEC, NPTEL, IIM-B
2	Post Graduate Courses	UGC, AICTE, IIMB, NPTEL

Source: https://swayam.gov.in/

Table 4 List of free Education and Learning Services during COVID-19 pandemic

S. No.	Education e-tools	Operational Efficacy for Students & Establishments
1.	LinkedIn	Foster virtual meeting tools & 16 learning courses related to staying protective etc.
2.	McGraw-Hill	Free e-library of e-books and other resources as a remote instruction up to Ph.D. level and research scholars.
3.	Scribd	Millions of e-books, audio books, magazine articles : free for 30 days
4.	Coursera	Access to 3800 courses & 400 specializations. 5000 licenses for enrolled students till 31st July, 2020. It has estimated 50 lakh Indian learners.
5.	JetBrains	Free Project-based learning program for both students and teachers.
6.	Avid	Free, temporary license of creative tools to qualified media enterprise & educational customer.
7.	Codeacademy	Free 10,000 scholarships from high school to college students across the world for the rest of the year.
8.	upGrad	Offers courses in Higher Education in subjects like data analytics, deep learning, block chain technology management, AI and machine learning.
9.	Zoom	Free Video Conferencing tool
10.	Facebook	Free Video Calling and file sharing for emergency services for 12 months (Organizations to sign up until June 30 to avail the offer)
11.	Google	Video Chat (premium workplaces), 25o participants per call feature, live streaming up to 100,000 viewers with a domain. Additive special feature of recording meetings and saving to Google Drive.
12.	Intermedia	Free Video Conferencing for all for 2020 while Pro Video Conferencing until 2021

Source: https://www.entrepreneur.com/article/347840

Table 5 Case Study Case 2 of Study on Response of Madhya Pradesh: e-Learning records

Awadhesh Pratap Singh University (Rewa) 205 online interacting classes 20 video lectures	**Barkatullah University (Bhopal)** 374 online interactive classes 10 video lectures 119 PDF Lectures 23 Research papers published	**Devi Ahilya University (Indore)** 815 online interactive classes 985 video lectures 242 audio lectures 1633 PDF lectures 116 Research papers published
Jiwaji University (Gwalior) 205 online interactive classes 191 audio lectures 1269 PDF Lectures 25 Research papers	**Rani Durgavati University (Jabalpur)** 139 online interactive courses 19 video lectures 80 audio lectures 165 PDF lectures 1 Research paper published	**Vikram University (Ujjain)** 83 online interactive courses 43 PDF lectures 21 video lectures 12 audio lectures 6 research papers published

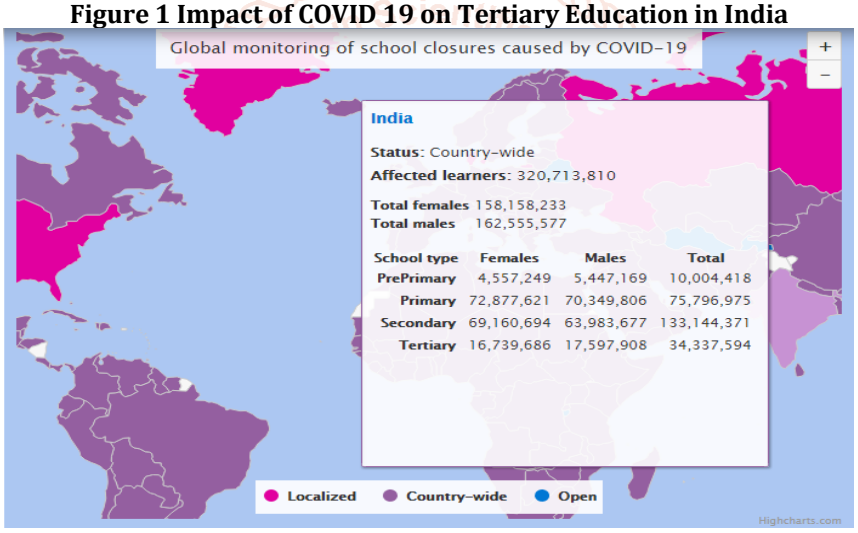
Table 6 State-wise Initiatives for promoting online education

S. No.	State/city	Online Platform
1.	Assam/Guwahati	WhatsApp (Phone-based material) Google Classroom
2.	Gujarat	Broadcast lessons through Private TV Channel Platforms like Facebook Live, Zoom, Webex and Google Classroom
3.	Chhattisgarh/Raipur	'Mirchi ki Pathshala' started co-jointly by Radio Mirchi and UNICEF (radio-based education campaign) i.e. Radio Schooling Telegram (for video lectures)
4.	Delhi	Interactive Voice Response (IVR) systems (for students without smartphones) Direct Benefit Transfer (DBT) of Rs. 200 (who attend live classes regularly)
5.	Bihar/Patna	Bihar Education Project Council (BEPC) with UNICEF (broadcast education programs via All India Radio (AIR)
6.	West Bengal	ABP Ananda (televise lessons for class IX to XII)
7.	Hyderabad	Coursera
8.	Bangalore	MeetApp Slack, Zoom, Trello Webinar Google Meet
9.	Madhya Pradesh/Bhopal	Zoom App
10.	Uttarakhand/Dehradun	Skype Google Meet

Source: https://www.biharedpolcenter.org/post/covid-19-learning-in-times-of-pandemics

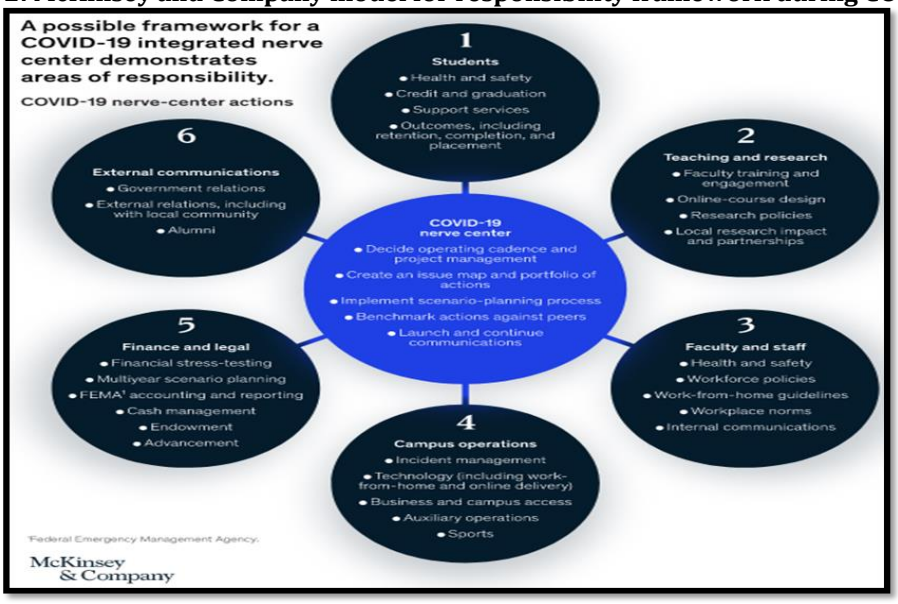
Annexure II Figures

Figure 1 Impact of COVID 19 on Tertiary Education in India



Source: https://en.unesco.org/covid19/educationresponse

Figure 2: McKinsey and Company model for responsibility framework during COVID-19



Source: https://www.mckinsey.com/industries/public-sector/our-insights/getting-the-next-phase-of-remote-learning-right-in-higher-education

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