

# **INNOVATIVE APPROACHES IN HIGHER EDUCATION**

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Edited by  
**Dr. Sunita Vithalrao Magre**  
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## EDITORIAL NOTE

In today's world there are number of things to learn and study through various kinds of means and modes of sources available. Advance pedagogy is the way to enhance teaching and learning performance. Different innovative teaching methods are now in use across the globe. Hybrid teaching includes e-learning in addition to the face to face teaching. Use of technology and multimedia is a new pathway for higher education approach. Advances in the technology, that too in the digital world is leading us the way more to use and utilize this means of education through which we can access and learn the education in any which place, or time as we want and how much or what exactly we want to learn without the need to have a teacher's presence in front of them. Learning in informal settings, such as museums and after-school clubs, can link educational content with issues that matter to learners in their lives. These connections work in both directions. Learning in schools and colleges can be enriched by experiences from everyday life; informal learning can be deepened by adding questions and knowledge from the classroom. These

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## Teaching and Learning by Innovative Methods used During Corona Pandemic through Online Classes

**Mr. Mohammad Usama**

### Abstract:

Higher Education in world today is facing one of the biggest challenges ever because of the Corona Pandemic. Education system has completely changed and online Education which seems a distant reality has now come to the surface as a dominant mode of teaching and learning in higher education. Offline Classes through Chalk and Blackboard teaching was not possible during the pandemic and overnight teachers were forced to adopt new teaching learning techniques. It appeared true that necessity was the factor responsible for this sudden and rapid change in education. Education at every level during Corona pandemic was delivered through online mode via Mobile Phones, tablets, Laptops and desktops. This

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has been the case also in higher education. Online education through Online classes, MOOCs, SWAYAM, virtual sessions, virtual labs, webinars, learning management systems, virtual conference etc. helped in bridging this gap during pandemic in higher education.

**Keywords:** Pandemic, Higher Education, MOOCs, Online Education, Information and communications Technology, learning management systems, SWAYAM, virtual labs.

### Introduction:

University and Colleges are buzzing cultural hubs and important seats of learning in higher education as students live and study in close proximity in the campuses. The basics of this distinct ecosystem have been impacted significantly by the rapid spread of the coronavirus which is also known as Covid-19, creating uncertainty regarding its repercussions for higher education. Higher Educational institutions are forced to cancel face to face offline classes and close the doors to campuses all over the world in response to the rising coronavirus cases. According to the estimate given by UNESCO more than 1.5 billion students in around 165 countries were out of school because of the COVID-19 pandemic and nearly 220 million tertiary-level students were affected around the world. In this scenario, online classes have emerged as the immediate as well as the long term solution for promoting and continuing higher education.

Online mode of learning refers to various synchronous and asynchronous learning activities like accessing eResources in the form of Open Educational Resources (consisting of formats like animations, text, simulations, graphics, interactive

multimedia, gaming, etc.) which are uploaded on LMS by the instructor. MOOCs, online virtual sessions, participating in workshops and webinars can be used by students for learning purpose as per the guidelines given by the instructor, performing individual and group activities on ICT platforms, completing assignments and uploading on learning management system or other ICT platforms, attempting tests and quizzes, engaging students into online short term training programmes, online internships, simulations, virtual labs, e-conferences, museums, projects, etc.

#### **It Infrastructure (Hardware and Software) used for Online Class:**

Following is a list of infrastructure requirements for online Class:

- a. Personal Devices: Personal devices include Laptops, Mobile Phones, TABs, and Desktops.
- b. Lab Devices: For Laboratory Desktops are required as Lab devices.
- c. Audio/Visual Devices: Audio and Visual Devices includes Smartboard, Projector, Conference Solution, Voice Recorder etc.
- d. Graphics Board Tablet with Stylus are used for digital illustration work or photo retouching.
- e. Remote learning / remote examination through TAB.
- f. Mass Learning through Satellite Based TV Channel
- g. Low Cost IOT devices like Raspberry PI can convert TV to a smart TV.
- h. Faculty and student can access school computers and work from home through Remote VPN.
- i. LMS – Learning Management Server

- j. Simulation based Virtual Labs on Cloud (i.e. AWS / Microsoft / Google)
- k. Studio Setup for Lecture Recording (HD Camera, Lighting, Backdrop, Microphone, Video Editing Software like Adobe Photoshop / 3D studio max / Movie Maker /Coral Draw)
- l. Internet Leased Link (ILL) – approx. 1GBPS for 1000 students.
- m. Other Essential Software includes antivirus, Microsoft Windows Server, Network Monitoring Software, Office tools (e.g. MS Office/Libre Office)

#### **Online Study Material & Resources Useful for Higher Education:**

There are various online material & resources which can be used for higher education. These resources exists in form of Online courses (SWAYAM, MOOCs, and NPTEL.), Online library resources (National Digital Library of India), teaching resources (open access books, e-PG Pathshala, e-Content Courses of Courses, Cambridge University Press) and research resources (Shodhganga, Directory of Open Access Journals ,open access Thesis & Dissertations). Some of these are mentioned below with their websites link:

- SWAYAM [<https://www.swayam.gov.in/>]
- National Digital Library of India (NDL) [<https://www.ndl.gov.in/>]
- UG/PGUGC-MOOCs[[http://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs\\_courses.php](http://ugcmoocs.inflibnet.ac.in/ugcmoocs/moocs_courses.php)]
- e-PG Pathshala [<https://epgp.inflibnet.ac.in/>]
- e-Content Courseware in UG Subjects [<http://cec.nic.in/cec/>]

- National Programme on Technology Enhanced Learning(NPTEL) [<https://nptel.ac.in/>]
- Shodhganga-a reservoir of Indian Theses [<https://shodhganga.inflibnet.ac.in/>]
- Directory of Open Access Journals [<https://doaj.org/>]
- e-PG Pathshala [<https://epgp.inflibnet.ac.in/>]
- Open Access Thesis & Dissertations [<https://oatd.org/>]
- Open Knowledge Repository-World Bank [<https://openknowledge.worldbank.org/>]
- Free Open Access Books [<https://www.freetechbooks.com/>]
- Springer Open Journals [<https://www.springeropen.com/journals>]
- Oxford Open [<https://academic.oup.com/journals/pa>]
- Taylor & Francis Open Access [<https://www.tandfonline.com/openacc>]
- Cambridge University Press [<https://www.cambridge.org/core/what>]
- Science Direct Open Access Content [<https://www.sciencedirect.com/#open>]

### **Information and Communications Technology Tools & Initiatives in Higher Education:**

Important ICT initiatives useful for the higher education teachers of our country while implementing online classes are discussed under the following sections:

#### **a) MOOCs & SWAYAM:**

MOOCs means massive open online course which provides various interactive open access courses

through online education system. The aim of MOOCs is to provide online education with the help of features like study materials, quizzes, videos and online exams.

#### **b) OER: NPTEL, NMEICT, ePG, NDL:**

Open educational resources (OER) are those educational resources which support open access and these learning materials support free and legal copying, usage, adaptation and sharing. They are introduced with an open license and are available in the public domain. These resources can be in form of videos or animation, syllabi, lectures notes, tests and textbooks etc. Creative Common license is created with the idea of sharing and collaborating in open educational resources.

#### **c) Platforms: Learning & Evaluation: LMS**

LMSs are web applications that can be accessed by using a web browser and they run on a server. LMSs helps in giving educators tools through which they can create a web site for course in which only enrolled students can access. Online Discussions, Chats, Quizzes, Surveys, Assignments, Exams can be conducted in LMS. Some of the most used LMS are as follows:

S. No.	Title	Licensed/Open Source	Link
1	Google Class Rooms (USA)	Licensed/Free (For Limited Users)	<a href="http://classroom.google.com/">http://classroom.google.com/</a>
2	Moodle (Australia)	Open Source	<a href="http://www.moodle.org/">http://www.moodle.org/</a>
3	Zoom Learn	Open Source	<a href="https://zoomlearn.com/">https://zoomlearn.com/</a>
4	ProProfs LMS (USA)	Open Source	<a href="https://www.proprofs.com/c/category/lms/">https://www.proprofs.com/c/category/lms/</a>
5	NEO (India)	Open Source	<a href="https://www.neolms.com/india">https://www.neolms.com/india</a>

**d) Virtual Lab ([www.vlab.co.in](http://www.vlab.co.in)): Open Source / Support:**

Virtual labs help (UG, PG & research scholars) in providing remote-access to Labs in all major disciplines of Engineering and Science. These Virtual labs can be used in Learning Management System where the students can use the different tools for learning, including animated demonstrations, web-resources, video-lectures & self-evaluation.

**e) SimLab+ ([www.simlab-soft.com](http://www.simlab-soft.com)): Licensed Tool:**

Process-oriented multidisciplinary simulation environment which accurately analyze the performance of complex assemblies is known as SimLab. SimLab is designed with powerful 3D visualization and is a communication platform with a rich set of built-in workbenches.

**f) Robotics:**

(<https://www.e-yantra.org/>: NMEICT Project

<https://www.sc.iitb.ac.in/robotics/index.html>)

Robotics is a branch of science and engineering that deals with the design and construction and use to control robots, information processing and sensory feedback. Institutions are now starting use of teaching robots for imparting knowledge to their students.

**g) FOSSEE ([www.fossee.in](http://www.fossee.in)): Open Source:**

FOSSEE is an Open Source Software for education and this project promotes the use of educational tools in research and academia. Some of the projects which are promoted by FOSSEE are:

**R:** For statistical computing and graphics R language is used.

**QGIS:** Quantum GIS is a desktop geographic information system application.

**PYTHON:** It is useful for scientific computing and is easy to read and learn.

**ICT Tools used for Collaboration & User-Generated Content:**

ICT tools can prove as a great aid to the teacher in co-creation of knowledge by learners. Some of the ICT tools used for collaborative learning are mentioned below:

**a) Concept-mapping, Mindmapping & Infograph Tools:**

In collaborative learning environment concept-mapping and Mindmapping ICT tools like Google Drawing, Miro, Conceptboard, Bubble.us, Coggle, help learners come together online for discussing and establishing relationships of concepts related to a topic or theme. Online tools use features of adding images, sketches, videos, links to other files, hyperlinks etc.

**b) Blogging:**

Teachers can create a blog and then students can be added for contribution in blog. Teacher can be facilitator to guide students about posting in blog and can be used as asynchronous activity.

**c) Stickynotes:**

Online brainstorming can be done through stickynotes tools like Jamboard, IdeaFlip etc.

**d) Shared Documents & Comprehensive Activity Tools:**

ICT tools like Google Doc, etherpad, Google slides, ideaboardz, ScatterSpoke etc. can be introduced to

students. Comprehensive activity platforms like Miro, Padlet, Whimsical, etc. may prove effective virtual workspaces.

### **Problems Associated with Online Education:**

The Corona pandemic has caused huge disruption to higher education around the world and has directly affected students' decisions about where to study once they finish their schooling. Research conducted by Cambridge International's Annual Destinations survey reported that in 84 percent of schools surveyed most of the students have changed their minds about university or their first choice destination because of facing financial hardships during pandemic or largely as a result of general uncertainty.

Online classes were considered previously too as a very fruitful method for strengthening higher education. But the pandemic brought fast strides in online education. It also exposed our weakness in adopting online mode of education as the indispensable mode of teaching in India and World. During the Corona pandemic internet connectivity was a big issue followed by affordability and less availability of gadgets like Mobile Phones and Laptops in comparison to the huge demand in rural as well as urban India. Education in rural areas was totally crippled as there was a huge difference in availability of smart phones and laptops in rural areas in comparison to urban areas. The other issues faced include that was universal in nature was that a mark decrease in level of attentiveness of students in online classes were observed in comparison to offline class.

### **Conclusion:**

The pandemic corona has made us realize that there is need of development of robust online

education system in higher education. This will be the most effective tool in maintaining student retention and access to learning. Learning management systems, online courses through MOOCs and NPTEL etc. are big advantage along with online library resources in higher education. So, we can say that for teaching and learning through online mode we require accessibility of internet, hardware, bandwidth, space and some other related resource. The higher education sector has faced difficult times in the past but it has come out successfully and in this digital age, universities and colleges are much better placed today to provide students with easy and affordable access to continue their studies online.

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