

CURRENT TRENDS OF MOOCS IN INDIA: HISTORICAL BACKGROUND, DEVELOPMENT AND CHALLENGES

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ABSTRACT:

This article investigates the many variables that impact the adoption of Massive Open Online Courses (MOOCs) in the Indian higher education sector. A MOOC is similar to a tool for offering educational materials via an online platform to a sizable number of students around the world with the potential of receiving education from the best schools. In 2008, MOOCs were established and attained momentum in 2012 as a popular learning tool (Biswas & Sarkar, 2020). At present, the enrolment of students in MOOCs has grown tremendously. After the USA, India is leading the universal outgrowth in student engagement (Reddy, 2020). Observing the enhancement of enrolment in the higher education sector and also fulfilling the demands of the students, India has launched different project programme for offering MOOC courses in Higher education. At present, platforms such as NPTEL (2003), mookIT (2014), IITBombayX (2016), and SWAYAM are used in India to offer MOOC courses (2016). MOOCs have played a major role in increasing the Gross Enrolment Ratio in the field of Higher Education (Banwari, 2018). A key issue that Indian higher education is currently grappling with is the lack of coordination and its application to various economic sectors. However, these problems are eradicated by the MOOC programme because maximum courses of the MOOCs are related to industry demand and needs. In this article, conceptual and technical descriptions of different MOOC platforms are provided along with their components and features. The present study also attempts to explain why MOOCs are so necessary in countries like India and what are the benefits and challenges for the implementation of MOOCs. MOOCs in countries like India provide lifelong opportunities to learn and work together. In a large nation such as India, MOOCs promote the idea of inclusive, lifelong learning.

Keywords: MOOCs, Indian MOOCs platform, challenges

1. Introduction:

Massive Open Online Courses (MOOCs) Over the past few years, MOOCs have generated significant buzz in the higher education sector and much debate among students, teachers, educationists, higher education institutions, civil society, government, policymakers, and private organizations.

In this 21st-century digital era, it has been observed that most countries around the globe are supporting more and more online, virtual initiatives in the sphere of education. Numerous studies have examined the use of online learning throughout the world, and it has been shown that developed nations, where more than 70% of education is given online, use online learning more frequently than other regions. However, because it is a field that is only accessible to a tiny segment of a developed population in a country like India, the practical implementation or usefulness of many online courses such as MOOCs is not as widespread and successful even in the current situation. However, rural areas in India have experienced the greatest population expansion, and residents there lack the resources to attend high-quality education. From these perspectives, MOOC courses play a leading role in providing a cost-effective way of learning. The most beneficial aspect of MOOCs is that different kinds of courses offered by top universities and professors are available. There are also facilities of MOOCs, such as free access to lectures and contents and access to courses in diverse areas for diverse people. Because there are no drawn-out procedures, formalities, or prerequisites for enrolment in a course, MOOCs are learner-friendly. The demands for MOOC came along with the digital era. The University Grant Commission (UGC) took the initiative to promote the CBCS system and credit transfer, so the Indian higher education sector has been mandated by UGC to deliver 20% of courses through MOOCs (Bordoloi et al., 2020). Additionally, MOOCs have several limitations; for example, a teacher's physical attributes and the experience of a true classroom learning setting cannot be replaced.

2. Objectives of the study:

The following goals are being attempted to be met this study:

1. To study the basic conception and features of MOOC programmes in India.

2. To study the history and development of MOOCs programmes in India.
3. To identify the challenges and problems in executing MOOC programmes in India.
4. To study the advantages and disadvantages of MOOC courses.

3. Significance of the study:

From the different studies, reviews, and discussions in the literature, the researcher finds that the rising population growth, insufficient teaching-learning materials, deficiency of infrastructure, scarcity of teachers, educational institutions, and other necessary resources has constantly created hindrances in the path of yielding knowledge in a country like India. MOOCs are one of the vital tools to support open learning for such learners who need to remain outside of formal classroom teaching. The most remarkable recent example revealed by the (UNESCO) that over 800 million learners from around the world have been affected during COVID-19 (*CoronaVirus: Don't Let Our Children Down!*, 2020) and in India, over 286 million students from pre-primary to higher secondary school have been out since March 2020 (The Economic Times, 2020).

With this background, this study's primary objectives are to determine the various components influencing the successful implementation of quality, affordable MOOC programmes. This study also attempts to identify the various barriers and challenges faced while using MOOCs among students of different Indian universities.

4. Methodology:

A methodical approach to solving a research problem is known as research methodology. The term "methodology" refers to a trustworthy and dependable process for gathering and analyzing data to obtain knowledge (McMillian & Schumacher, 1989). For writing this paper and collecting the data, a review of related studies and content analysis was used. The author uses a qualitative method of literature study. Information's that is necessary is gathered from a variety of secondary sources, including articles, books, journals theses, different official websites of the government, and MOOC platforms like SWAYAM, NPTEL, mooKIT, IITBX, etc. The researcher also analyzed various literature reviews related to MOOCs published by several academicians, scholars, and researchers to gain a better understanding of the concept.

5. Introduction to MOOCs: Definition and Characteristics

Since the MOOC programme began in 2008, there have been many variations and definitions. Massive open online courses (MOOCs) are flexible, open, self-restrained, and designed for widespread involvement in online learning. One term or phrase associated with inclusive online learning styles is "MOOCs."

"An online course designed for open access and limitless participation via the web is known as a MOOC" (Kaplan & Haenlein, 2016).

When a course is developed for a large number of students, it is called a MOOC. These courses are accessible to anybody, anywhere, at any time, provided they have access to the internet, and there are no prerequisites for entrance qualifications. They also offer entire course knowledge online without any fee cost (*Definition Massive Open Online courses (MOOCs)*, 2015).

The completion rates are low for a whole MOOC course due to dissimilar motivations for enrolling in the MOOC. Even though accession to the course materials is free, MOOC platforms sometimes grant certificates for completing a course instead at a cost (Ansrsource, 2022). MOOC are such platforms that provide recognized institutions with cloud-based hosting environments for offering course content.

To analyze these definitions some Common meanings, emerge for the elements of MOOC:

- **Massive:** It is an online distance course developed for a huge number of participants. This means the number of learners must be larger than that of normal classroom participants or traditional campus-based classrooms.
- **Open:** Open means admitted to the course by anyone, anywhere, without fees and there is no mandatory qualification or required minimal qualification. In broad terms, open means freedom of time, place, and pace.
- **Online:** The total course content is delivered through the internet or web-based.
- **Course:** Course offers a complete learning experience or unit of study through a structured form. Full course including a set of education goals and objectives, defined subject fields, course materials, tasks, activities, assessment, feedback, examination, and certificate/degree of completion.

➤ Features of MOOCs platforms:

- It is mostly used in the non-formal system of education.
- MOOCs are used in both PDP and degree-oriented academic Programmes.

- It used an online platform to develop and operate the program.
- MOOC courses should be delivered in both synchronous and asynchronous modes.
- E-tutorial- (it's including Audio-video lessons, simulations, animations, etc.)
- E-content – (E-books, pdf, OER, Case studies, articles, presentations, etc.)
- Discussion forum (it means real-time discussion between the learners and the course coordinators)
- Assessment (MCQs questions, Quizzes, short and long answer-based questions)

6. Historical Background and perspective for the Development of MOOCs:

MOOC is the usual evolution of Open Course Ware, first made by the Massachusetts Institute of Technology (MIT) in 2001. Therefore, MIT is also leading the improvement of MOOCs, first with MITx, and then with the help of edX. Dave Cormier first suggested MOOCs in 2008 to characterize the course "Connectivism and Connective knowledge" by Siemens and Downes (*A Brief History of MOOCs*, n.d). Modern online course efforts by organizations people, and private and professional organizations commonly go by the name of MOOCs.

The Indian administration has also undertaken several steps to flourish the idea of online open distance learning. Initially, the government arranged some open resources for everybody in terms of online repositories, e-libraries, e-content, e-books, educational media files, etc.

The governance of India launched the "Study Webs of Active Learning for Young Aspiring Minds" project after realising how important it was for nation like India to deliver high-quality educational resources and programmes across the country. For distance learning online courses, SWAYAM provides a platform and website that are interconnected through the support of information and communication technology (ICT). SWAYAM also includes all higher education courses, skill-based courses, and upper secondary education to guarantee that every student gains something from using online e-learning resources.

Features of SWAYAM:

1. SWAYAM is an interactive e-content platform for mobile devices that can be used for courses from high school to college.
2. It is one kind of art of educational system that offer to easy access, monitoring, and certification.
3. It could very provide a good quality teaching-learning environment using multimedia resources on every time, everywhere basis.
4. It is also a platform for whole-group collaboration, interaction and discussion forums to light up suspicion.
5. It is one kind of hybrid model of delivering the quality-based content in a classroom teaching-learning environment.

In this situation, SWAYAM has taken the responsibility for the improvement and development of MOOCs courses with compliant technology-based content (likes audio-video, picture, and text) and setting up a large-scale based IT learning platform. The National Mission on Education through Information Communication Technology (NME-ICT) Programs includes the MOOC initiative. Under NME-ICT, NPTEL, one of the MOOC course platforms, promoted online subjects content centred around 23 disciplines and 933 courses. NPTEL is made up of 7 IITs and IISc (Lazarus & Suryasen, 2022).

Now we can understand the successive improvement and progress of the MOOCs for the SWAYAM platform, adhering to rules that mention the technical and standard production of e-content and resources for MOOCs courses.

- a) MOOCs are online courses created in accordance with the direction criteria for the next four quadrants:
- b) "Four quadrants approach": The four-quadrant method often takes into account an e-learning method that includes the following elements:
 - **First-Quadrant is an e-Tutorial:** It should include simulations, animation-based content, video demos, a virtual lab, and other things.
 - **The Second-Quadrant is e-Content:** Which should include interactive simulations where necessary, PDF content, text, e-books, graphics, and video presentations.
 - **The Third-Quadrant is Web Resources:** It should include related links, Wikipedia resources, case studies, open-source internet resources, books (together with e-books), research papers and journals, anecdotal record report, articles, and the historical growth of the subject.
 - **The Fourth-Quadrant is Self-Assessment:** This quadrant should consist of problems and resolution, it should be in various forms like Multiple Choice Questions, fill in the blanks, Matching Questions, Short Answer Questions, Long Answer Questions, Quizzes, Homework, Assignments and solutions, Discussion forum topics and setting up the FAQs, and rectification of common misconceptions.

SWAYAM has selected 9 national coordinators to ensure that the highest quality instruction and content are created and delivered. This are-

Table-1: Nationwide MOOCs Coordinators Authority:

S.NO	Nationwide MOOCs Coordinator	Sectors
1	AICTE (All India Council for Technical Education)	It is an international course that is self-paced.
2	University Grants Commission (UGC)	Master degree programmes offered (Non – Technology category)
3	NPTEL-National Programme on Technology Enhanced Learning	Offers Under-Graduate and Post-Graduate degree programmes that are technological or engineering-based.
4	Consortium for Educational Communication (CEC)	Non-technology degree courses are offered as part of the graduation degree programme.
5	IGNOU	IGNOU courses for certificates and diplomas.
6	CBSE NCERT	Class 9-12 of the School Educational Programs are available.
7	NIOS (National Institute of Open Schooling)	Open education or out-of-school educational programmes for students in grades 9 to12 standard.
8	IIM Bangalore	Management education
9	NITTR-National Institute of Technical Teachers Training and Research in Chennai	Teacher training program.

Source: (MOOCs Massive Open Online Courses An initiative under National Mission on Education through Information Communication Technology (NME-ICT) Programme, 2015).

7. Historical Development & Features of different types of MOOCs platforms in India:

The government of India launched a plethora of activities every day to strengthen and promote the idea of open education. The Indian government initially took the initiative to make all types of open resources, including digital libraries, repositories, and educational media assets such as audio, video, journals, articles, e-books, etc., available to the public. At present, there are so many efforts taken in this direction starting with various free online platforms such as the National Digital Repository of IGNOU, DIKSHA, e-pathshala, NISHTHA, e-gyankosh, NROER (National Repository of Open Educational Resources), SAKSHAT (platform for all educational news), E-Shodhsindhu (collection of e-journals), e-Yantra (Lab for the experiment), etc. Online education has gained popularity, and India began to develop it. Therefore, the government of India set up online course platforms such as MOOCs to offer free online courses. NPTEL, SWAYAM, mooKIT offered by IIT Kanpur, and IITBX offered by IIT Bombay are the major MOOC programmes that are now offering online education. Some of these organizations' works and efforts are briefly discussed below-

1. NPTEL

In India, NPTEL was first launched by MHRD in 2003. The Indian Institute of Science (IISc) and the Indian Institutes of Technology (IITs) are joint initiatives to offer online MOOC courses through this platform for the engineering and science stream free of cost. At present, NPTEL has started various types of courses for different streams such as mechanical, electrical, management, ocean engineering, computer science, humanities, and music. Currently, it offers 2400+ courses and total enrolments of more than 1.82 crores (NPTEL, n.d.). NPTEL has delivered its courses through open-source technology. The classes are run on Google's open-source course

Builder platform, which also hosts App Engine and Compute Engine. The majority of NPTEL's course materials are presented primarily through video lectures created in a traditional classroom setting.

2. mookIT

In 2014, the Indian Institute of Technology at Kanpur (IITK) created mookIT, a scaled-down version of the MOOC management system that also used open-source technology. This system is reliable and capable of providing online courses at many levels, from micro to macro. It was created specifically as a platform for connectivist MOOCs (cMOOC). More than 200,000 people have registered for its 200+ courses that are currently being offered (*mookIT*, n.d.). Because mookIT offers an audio stream with play sync slides that is extremely comparable to the video experience, it is especially useful for students who live in remote rustic areas not having smartphone, laptop, computer, high bandwidth, or reliable internet service. Learners only need a basic phone to receive a phone call and listen to audio.

3. IITBX

IIT Bombay developed the non-profit MOOC platform IITBX in 2014 using the open-source Open edX technology. The Government of India's MHRD was responsible for its conception, development, and funding through National Mission on Education through Information and Communication Technology (NME-ICT). The goals and objectives of IITBX are to spread high-quality education wherever there is internet access and to improve and increase access to education for students who are dispersed over rural and far-flung places. At present IITBX have offers 200 courses on different subject domains. Each of these courses is categorized into four learning areas: EduMOOCs, LifeMOOCs, SkillMOOCs, and TeachMOOCs for various learning needs (*IITBombayX*, n.d.).

4. SWAYAM

Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) is an acronym. The government of India's Minister of Human Resource Development (MHRD) unveiled SWAYAM, the country's national MOOC platform. SWAYAM's major goal is to make the better teaching and learning materials available to everyone, even the most least fortunate students. It was initially decided to start more than 2000 courses, which made it the largest course provider among all the providers at that time (*Swayam Central*, n.d.). For those students who have up until now been untouched by the digital revolution and are incapable of taking part in the mainstream acquisition of wisdom for the economy, SWAYAM aims to bridge the digital divide.

▪ Other majors MOOCs platforms: -

- **Coursera:** This is a type of profit-making company that was established by two Stanford University computer science professors. More than 5800 courses, professional certificates, and degrees from renowned institutions are available there (*Coursera*, n.d.).
- **Udacity:** Additionally, a professor of computer science from Stanford University launched this platform for profit business. It aids in developing competences for in-demand skills with the most cutting-edge tech organizations worldwide and is instructed by outstanding industry leaders. Over 160,000 students in more than 240 countries enrolled in this platform and distributed 205k nanodegree certificates, and 73% graduate students consented that it was a favorable career change platform (*Udacity*, n.d.).
- **Khan Academy:** Salman Khan, a graduate of MIT and Harvard, founded the non-profit company (Kaur, 2019). The goal is to offer world-class education at no cost of everyone, everywhere. Students can practice and learn at their own pace.
- **Udemy:** It is a for-profit platform. Through this platform, students learn at their own pace, with lifetime access on mobile and desktop devices. Here students also learn in-demand skills with over 213,000 video courses, and chose courses taught by real-world experts. In this platform in total 830 million enrollments and students enrolled were 62 million and more than 180+ countries membership and it can offer 75+ languages for the users (*Udemy*, n.d.).
- **WizIQ (India and USA):** IIT Delhi, India provides a wide variety of courses through this platform, all of which initially require registration and a price deposit to enroll (Kaur, 2019).

Table-2: Historical Development of Indian MOOCs Platforms

MOOCs Platform	Opening Year	Institution behind launch	Official URL of a Website
NPTEL	2003	IIT-Madras	npTEL.ac.in/
mookIT	2012	IIT-Kanpur	www.mookit.co/
IITBX	2014	IIT-Bombay	iitbombayx.in/
SWAYAM	2016	MHRD & Microsoft	swayam.gov.in

Source: Sources are taken from the above given website Link

Table-3: Feature& Comparison of Major MOOC’s platform providers in India

MOOCs Platform	Learning Mode	Course Format	Total Number of Courses	Total Number of users	Regulatory Credits	System Language	Mobile Application
NPTEL	Online	Scheduled, Self-paced	2400+	1.82 crore	Partial/ Half	English	Yes
mooKIT	Blended	Scheduled	200+	2 Lakh	Half	English, Hindi, French, Russian, Ukrainian	No
IITBX	Online	Scheduled, Self-paced	200	1.25 million	Half	English	No
SWAYAM	Blended	Scheduled, Self-paced	2150+	2.72+crore	Full credit	English, Hindi	Yes

Source: Sources are taken from the above given website Link

8. Challenges to Successful Implementation of MOOCs Programs in India

The accessibility, usability, and quality of MOOCs programmes in India have grown remarkably in the recent few years. However, there are still many barriers in the way of MOOCs being successfully implemented in India. Some major current problems and challenges are discussed here.

1) Lack of Awareness among students about the MOOC courses-

The MOOC programme is not new in India; it started many years ago in 2003, but still, the awareness and popularity among the students are significantly low regarding the MOOC courses and their benefits (Devi, 2019). Shaikh (2017) study on the knowledge of student-teachers about MOOCs reveals that awareness of MOOCs among students is relatively low, even when students have negative impressions of MOOCs.

2) Lack of engagement in the real workplace-

It was observed that maximum MOOC platforms could not provide the opportunity for MOOC candidates to enter the actual workplace so that they can expose themselves to new fields or training in specific skills, often in emerging industries.

3) Lack of proper credit for MOOC certificate-

From the beginning, MOOC platform providers only offer a learning pathway of certification, which is not akin to university credits. As a result, the current trend for students to showcase their MOOC certificate only in personal job interviews, job portals, CVs, and personal profiles (LinkedIn, e-portfolio) is obvious.

4) High cost of MOOC production-

There is no sustainable economic model to offset all the costs incurred in MOOC creation, and MOOCs have high and variable attendance cost. The production and delivery of MOOCs involves several significant cost areas, including staff and faculty, administrators, instructional support staff, various types of content development, high-quality videography, photography, virtual labs, simulation, gamification, delivery platforms, and technical support. As a result, some MOOC providers received payments, and gradually increased their course costs, and as a result, students lost interest in MOOC courses.

5) Not address the diverse needs of students-

People in India, a secular and heterogeneous nation, come from various multicultural and multilingual families. There are hundreds of regional languages in India in addition to the 22 official main languages. Therefore, it was exceedingly challenging for MOOC organizers to create the content and provide the courses in such a wide range of languages (Chauhan, 2017). The NEP 2020 initiative emphasizes the importance of developing and delivering technical and vocational education in multiple languages.

6) Insufficient digital infrastructure-

A high-speed internet connection and digital materials, especially online platforms like MOOCs, are essential for any kind of online learning student. They will need a few basic items, such as a smartphone, computer, tablet, and a high-speed internet connection to attend MOOC courses. But in developing countries like India, maximum learners cannot afford all of these because they belong to economically poor families.

7) Gender gap and low enrolment in MOOC courses-

It was noted that there are a great number of failing courses in a nation like India due to the extremely low enrollment ratio and other common causes, such as a lack of digital marketing and advertising (Devi, 2019). The issue also applies to MOOC courses. Gender imbalance in enrollment presents another difficulty for MOOC courses. According to Bayeck (2016), women candidates enroll at higher rates when collaborative/group courses are available.

8) Ensuring the content overall quality of MOOCs-

Across the world, the vital concern and issue is the quality of MOOC courses and their content. For developing MOOC courses, the foremost necessary thing is highly qualified and skilled teachers/instructors along with high-quality resources. However, in India, there is always a shortage of these components. Even in NEP 2020, several recommendations and suggestions are given for identifying these issues. Such as adopting the credit transfer mechanism, enhancing continuous teacher training programmes and promoting MOOCs (Sharma & J.C, 2022).

9) Advantages and disadvantages of MOOCs in India:

MOOCs have the power to change barriers in the path of Indian higher education. Gradually, university enrolment is growing because of the discovery of some open and distance online-based platforms, where students can study at any time at their own pace free of cost or a minimal fee. From this perspective, digital technology-based platforms such as MOOCs could help so much. Here, we discuss some advantages and disadvantages of MOOCs.

Advantages of MOOCs:

Some advantages of MOOC courses are as follows:

- Most MOOC courses have free or nearly free access to the content and lectures.
- For MOOCs, courses do not require physical infrastructure.
- Opportunities to offer diverse courses from top universities and outstanding professors are available.
- Students can study from anywhere, at any time because everything is available online.
- Through an online mode environment, students fearlessly share their thoughts with others.
- Available MOOC courses in diverse areas for a diverse audience.
- In the MOOC platform, learners can invest and think for as long as they wish before sharing something.
- It allows students to work as a team and create group communication through an online platform.
- In these courses, the availability of faculty members or instructors is much higher even after the class than in traditional learning.
- Students can review and revise lectures immediately.
- MOOCs can create opportunities for global students to bring people together.

Disadvantages of MOOCs:

Some disadvantages of MOOCs courses are as follows:

- MOOCs cannot provide personalized content and personal attention by the instructor.
- MOOCs cannot offer the real physical classroom environment and physical appearance of a teacher.
- Language is one of the biggest barriers to MOOC courses. Because maximum courses are offered by the MOOCs in the English language. Hence, every kind of learner could not engage in MOOC courses.
- The total contents of MOOC courses are delivered through online mode, so it is necessary to have an internet connection. However, in India, the internet connection in remote areas is very poor, so it is a big barrier for MOOC courses.
- MOOCs are completely web-based courses, so there is a chance of plagiarism because students' activity also not monitoring.
- Interaction between students and teachers is crucial for the entire development of personality and behavior but there is little opportunity for this in MOOC courses.

9. Conclusion

India is one of the nations where online distance learning is becoming increasingly popular, using a variety of online platforms, one of which is the MOOCs platform. MOOCs are so famous for learners because they are open to everyone, offer free online courses, free access, minimum necessary qualification, quality faculty, and are affordable and fixable ways to learn new skills. For a variety of learning-related purposes, including career development, skill and professional development, changing careers, alternative learning, lifelong learning, self-paced distance learning, interactive e-Learning and training, millions of people in India have recently turned to MOOCs. In a country like India, the majority of citizens reside in remote rural areas that do not have proper platforms to access skills enhancement training and other quality learning. From this perspective, MOOCs can

play a pivotal role. However, numerous difficulties, complications, and difficulties are encountered when implementing MOOCs in India. The study mentions these difficulties and problems. MOOCs are large, open, and usually free, and they solve two important issues with contemporary education: accessibility and cost. Thus, MOOCs pose a serious threat to traditional higher education in India. The fact that MOOC dropout rates are high because various MOOC students have different goals makes assessing their progress difficult. While some just want to learn something, others want to finish the course. It is a failure for MOOCs. With open enrolment at no cost and essentially no deadlines, MOOC completion rates will always be lower—possibly much lower. Nevertheless, MOOCs can significantly contribute to student empowerment and the accessibility and affordability of education. To live up to this promise, MOOCs need to do more than deliver excellent lectures.

References:

- A brief history of MOOCs.* (n.d.). MAUT. <https://www.mcgill.ca/maut/current-issues/moocs/history>
- Ansrsource. (2022, May 24). *The Promise and Challenges of MOOCs.* <https://ansrsource.com/the-promise-and-challenges-of-moocs/>
- Banwari, V. (2018). Role of MOOCs in Indian Higher Education. *Journal of Emerging Technologies and Innovative Research (JETIR)*, 5(12), 402-407. <http://www.jetir.org/>
- Bayeck, R. Y. (2016). Exploratory study of MOOC learners' demographics and motivation: The case of students involved in groups. *Open Praxis*, 8(3), 223-233. <https://doi.org/10.5944/openpraxis.8.3.282>
- Biswas, S., & Sarkar, M. (2020). MOOC: Challenges & Prospects in Indian Higher Education. *Journal of Information and Computational science*, 10(2), <https://www.researchgate.net/publication/364329757>
- Bordoloi, R., Das, P., & Das, K. (2020). Lifelong learning opportunities through MOOCs in India. *AAOU Journal*, 15(1), 83–95. <https://doi.org/10.1108/aaouj-09-2019-0042>
- Chauhan, J. (2017). An overview of MOOC in India. *International Journal of computer Trends and Technology (IJCTT)*, 49(2), 111-120. <https://doi.org/10.14445/22312803/ijctt-v49p117>
- CoronaVirus: Don't Let Our Children Down!* (2020). <https://campaignforeducation.org/en>.
- Courseera. (n.d.). <https://www.coursera.org/>
- Definition Massive Open Online courses (MOOCs). (2015). https://www.openuped.eu/images/docs/Definition_Massive_Open_Online_Courses.pdf
- Devi, R. (2019). Massive open online courses and challenges in India. *International Journal of Applied Research.*, 5(8), <http://www.allresearchjournal.com/>
- IITBombayX. (n.d.). <https://www.iitbombayx.in/>
- Kaplan, A., & Haenlein, M. (2016). Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster. *Business Horizons*, 59(4), 441–450. <https://doi.org/10.1016/j.bushor.2016.03.008>
- Kaur, R. (2019). MOOCs in Higher Education: Challenges and Opportunities. *International Journal of 360° Management Review*, 7, 115-118. <http://www.ij360mr.com/>
- Lazarus, F. C., & Suryasen, R. (2022). The quality of higher education through MOOC penetration and the role of academic libraries. *Insights: The UKSG Journal*, 35(9), 1-17. <https://doi.org/10.1629/uksg.577>
- McMillan, J. H., & Schumacher, S. (1989). *Research in Education: A Conceptual Introduction* (2nd ed.). Scott, Foresman, Glenview. <https://www.worldcat.org/title/1151174201>
- MOOCs Massive Open Online Courses An initiative under National Mission on Education through Information Communication Technology (NME-ICT) Programme.* (2015). <https://www.aicte-india.org/downloads/MHRD%20moocs%20guidelines%20updat ed.pdf>.
- mooKIT. (n.d.). <https://www.mookit.co/>
- NPTEL. (n.d.). www.nptel.ac.in/.
- Reddy, T. R. (2020). MOOC in Higher Education in India: Benefits and Challenges. *International Journal of Research and Analytical Review (IJRAR)*, 7(1), <http://www.ijrar.org/>
- Shaikh, S. A. (2017). Student teacher awareness of MOOCs – massive online open courses. *International Journal of Educational Science and Research (IJERS)*, 7(6), 105-110. <https://www.tjprc.org>
- Sharma, R., & Sharmiladevi, J.C. (2022). An overview of Indian MOOCs. *Annual Research Journal of SCMS.*, 10, 31-42. <https://scmstpune.ac.in/journal>
- Swayam Central. (n.d.). <https://www.swayam.gov.in/>
- The Economic Times (Ed.). (2020, March 6). Delhi schools closed: All primary schools shut as coronavirus spreads. <https://economictimes.indiatimes.com/>.
- Udacity. (n.d.). <https://www.udacity.com/>
- Udemy. (n.d.). <https://www.udemy.com/>