

Empowering Indian Higher Education Through Open Educational Resources (OER) And MOOCs: Opportunities, Challenges and The Role of Academic Libraries

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Abstract

Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) have emerged as transformative innovations in higher education, offering equitable, flexible, and cost-effective learning opportunities to diverse learners. In India, the rapid advancement of digital technologies, coupled with government initiatives such as SWAYAM, National Programme on Technology Enhanced Learning (NPTEL), e-PG Pathshala, the National Digital Library of India (NDLI), and the National Education Policy (NEP) 2020, has accelerated the adoption of open and online learning. These initiatives aim to enhance access to quality education, promote lifelong learning, and bridge educational disparities across geographical and socio-economic boundaries. This conceptual study examines the opportunities, challenges, and the evolving role of academic libraries in promoting OER and MOOCs within the Indian higher education system. The study is based on an extensive review of secondary sources, including scholarly literature, government reports, policy documents, and institutional publications. The review reveals that OER and MOOCs contribute significantly to improving educational accessibility, affordability, learner engagement, digital literacy, and skill development while fostering blended and learner-centered pedagogical approaches. Academic libraries have expanded their traditional roles by facilitating access to open educational resources, supporting faculty in OER adoption and creation, managing institutional repositories, promoting copyright and Creative Commons awareness, and strengthening digital information literacy among users. However, challenges such as inadequate digital infrastructure, the digital divide, language barriers, limited awareness, quality assurance concerns, and low MOOC completion rates continue to impede their effective implementation. The study concludes that the successful integration of OER and MOOCs requires sustained policy

support, institutional commitment, faculty capacity building, technological infrastructure, and active participation of academic libraries. Strengthening these areas will enable Indian higher education institutions to build a more inclusive, accessible, and sustainable digital learning ecosystem that aligns with national educational goals and global open education practices.

Keywords: Open Educational Resources (OER), Massive Open Online Courses (MOOCs), Higher Education, Academic Libraries, Digital Learning. NEP 2020.

1. Introduction

The rapid advancement of information and communication technologies has transformed higher education worldwide. Traditional educational models are increasingly complemented by open and digital learning environments. Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) have emerged as important components of this transformation by providing unrestricted access to educational content and learning opportunities.

India possesses one of the largest higher education systems in the world. Despite substantial expansion, challenges related to affordability, accessibility, and quality continue to affect educational outcomes. OER and MOOCs offer viable solutions by enabling learners to access quality educational resources irrespective of geographical location and socio-economic status. The National

Education Policy (NEP) 2020 further emphasizes digital learning, blended education, and open educational practices to strengthen higher education.

2. Review of literature

UNESCO (2019) defined OER as educational materials that are openly licensed and freely accessible for use, adaptation, and redistribution. Wiley (2014) proposed the 5R framework of OER comprising retain, reuse, revise, remix, and redistribute.

Butcher (2015) highlighted the role of OER in promoting educational equity and reducing barriers to knowledge access. Hilton (2016) found that students using OER performed at par with or better than students using commercial textbooks while substantially reducing educational costs.

Daniel (2012) described MOOCs as disruptive innovations capable of expanding educational access globally. Hollands and Tirthali (2014)

reported that institutions adopted MOOCs to increase outreach and experiment with innovative pedagogical approaches.

Mishra and Singh (2017) observed that MOOCs significantly improved educational opportunities in India, especially in remote regions. Kumar and Thakur (2018) found that OER adoption in Indian universities remained limited due to inadequate awareness among faculty members.

Gupta and Gupta (2019) reported positive learner perceptions regarding SWAYAM MOOCs, whereas Murthy et al. (2023) identified MOOCs as important tools for lifelong learning and employability enhancement. Vidya (2022) highlighted the growing role of academic libraries in promoting awareness and utilization of OER.

One of the most significant contributions of OER and MOOCs to higher education in India is their potential to promote equity and inclusion. By removing cost and location barriers, these initiatives enable students from rural and underserved regions to access quality education. Increased participation of women and first-generation learners in MOOCs further underscores their inclusive potential (Murthy et al., 2023).

This study explores the concept, definitions,

advantages, and implementation of OER within the Indian educational framework. It examines key national initiatives and repositories such as SWAYAM, e-GyanKosh, National Digital Library (NDL), e-PG Pathshala, NPTEL, Shodhganga, and the National Repository of Open Educational Resources (NROER), which collectively promote democratized access to quality education.

The Study Explores the impact of SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) and MOOCs (Massive Open Online Courses) on academic libraries. The paper examines the opportunities and challenges presented by these online learning platforms for academic libraries, including shifts in resource allocation, expanded access to learning resources, support for lifelong learning initiatives, integration of open educational resources (OER), enhancement of digital literacy initiatives, data management and analytics, and collaborative partnerships (Narkhede, SP 2024).

Despite these advantages, the digital divide remains a major challenge. Unequal access to reliable internet connectivity, digital devices, and digital literacy limits the reach of OER and MOOCs. Language barriers also restrict

access, as most higher education content is available primarily in English. Addressing these issues is essential to ensure that open and online learning truly benefits all sections of society. (Manoj Kumar Bhambu, 2025)

3. Need for the Study

The rapid digital transformation of higher education has significantly altered the ways in which knowledge is created, accessed, disseminated, and utilized. Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) have emerged as innovative educational approaches that enhance access to quality learning resources, promote lifelong learning, and support inclusive education (UNESCO, 2019). In India, the implementation of national initiatives such as SWAYAM, National Programme on Technology Enhanced Learning (NPTEL), e-PG Pathshala, and the National Digital Library of India (NDLI), along with the provisions of the National Education Policy (NEP) 2020, has accelerated the adoption of digital and open learning in higher education (Government of India, 2020).

Despite these initiatives, several challenges continue to hinder the effective utilization of OER and MOOCs. These include inadequate digital infrastructure, low awareness among

faculty and students, limited digital competencies, language barriers, quality assurance concerns, copyright and licensing issues, and relatively low completion rates in MOOCs (Hilton, 2016; Liyanagunawardena et al., 2013). Moreover, the role of academic libraries in promoting open education remains underexplored, even though libraries serve as key facilitators of information access, digital literacy, open scholarship, and institutional repositories.

Academic libraries are increasingly expected to support faculty in identifying, creating, and adopting OER, facilitate access to MOOCs, provide training on copyright and Creative Commons licensing, and enhance users' digital information literacy. However, empirical and conceptual discussions focusing on the evolving role of academic libraries in India's open education ecosystem remain limited. Therefore, this conceptual study is necessary to examine the opportunities and challenges associated with OER and MOOCs in Indian higher education while highlighting the strategic role of academic libraries in promoting equitable, accessible, and sustainable digital learning. The findings are expected to contribute to policy formulation, institutional planning, and future research in

open education and academic librarianship.

4. Objectives of the study

- (i) To examine the concept and significance of OER and MOOCs in higher education.
- (ii) To analyze major OER and MOOC initiatives in India.
- (iii) To assess their impact on accessibility, affordability, and quality of higher education.
- (iv) To identify challenges affecting their implementation.
- (v) To examine the role of academic libraries in promoting open education.
- (vi) To suggest strategies for effective integration of OER and MOOCs.

5. Scope of the Study

This conceptual study examines the role and impact of Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) in strengthening higher education in India. The study focuses on the concepts, characteristics, and significance of OER and MOOCs; major national initiatives such as SWAYAM, NPTEL, e-PG Pathshala, National Digital Library of India (NDLI), and other open learning platforms; and the policy framework provided by the National Education Policy (NEP) 2020.

The study further explores the opportunities

offered by OER and MOOCs in improving access, affordability, quality, flexibility, lifelong learning, and digital inclusion in higher education. It also examines the challenges associated with their implementation, including technological, institutional, pedagogical, legal, and socio-economic barriers. Particular emphasis is placed on the evolving role of academic libraries in promoting open educational practices, facilitating access to digital learning resources, supporting faculty and students, enhancing digital literacy, and managing institutional repositories.

6. Limitations of the Study

The present study is conceptual in nature and is based exclusively on secondary sources of information, including scholarly literature, books, peer-reviewed journal articles, government publications, policy documents, institutional reports, and official websites. No primary data have been collected from students, faculty members, librarians, or higher education institutions.

The study primarily focuses on Indian higher education institutions and does not compare OER and MOOC initiatives with those of other countries. It discusses major national platforms and policy initiatives but does not evaluate the

effectiveness of individual MOOCs or institutional OER programmes through empirical investigation. The study is limited to OER and MOOC initiatives in India such as SWAYAM, National Programme on Technology Enhanced Learning, e-PG Pathshala, e-GyanKosh. National Digital Library of India (NDLI), e-GyanKosh, National Repository of Open Educational Resources (NROER).

7. Methodology

This study adopts a conceptual review methodology based on a systematic search and critical analysis of published literature on Open Educational Resources (OER), Massive Open Online Courses (MOOCs), and their impact on higher education in India. The review synthesizes evidence from peer-reviewed journal articles, books, conference proceedings, government reports, policy documents, and institutional publications to provide a comprehensive understanding of the subject.

A systematic literature search was conducted using major academic databases, including Scopus, Web of Science, ERIC (Education Resources Information Center), Library and Information Science Source (EBSCOhost), ProQuest Education Database, JSTOR,

Emerald Insight, SpringerLink, ScienceDirect, Taylor & Francis Online, Wiley Online Library, Sage Journals, Google Scholar, and DOAJ (Directory of Open Access Journals). Government and institutional publications were retrieved from the official websites of the Ministry of Education (Government of India), University Grants Commission (UGC), SWAYAM, National Programme on Technology Enhanced Learning (NPTEL), e-PG Pathshala, National Digital Library of India (NDLI), UNESCO, and the All India Council for Technical Education (AICTE).

The literature search was performed using combinations of keywords such as "Open Educational Resources," "OER," "Massive Open Online Courses," "MOOCs," "SWAYAM," "NPTEL," "digital learning," "higher education," "academic libraries," "NEP 2020," "India," and "open education." Boolean operators (AND, OR) were employed to refine the search and retrieve relevant studies.

The inclusion criteria comprised peer-reviewed publications, books, conference papers, policy documents, and official reports published primarily between 2015 and 2025, with selected seminal studies included where necessary to provide theoretical context.

The selected literature was analyzed using thematic content analysis, and the findings were organized into themes such as the evolution of OER and MOOCs, policy initiatives in India, opportunities, challenges, the role of academic libraries, and future directions for open education. This review methodology provides a comprehensive synthesis of current knowledge and identifies research gaps for future investigation.

The collected literature was reviewed using thematic content analysis. The information was organized under major themes, including the concept and evolution of OER and MOOCs, policy initiatives, opportunities for higher education, implementation challenges, and the role of academic libraries. Relevant information from official government reports and authentic institutional publications was incorporated to support the discussion. The study does not involve surveys, interviews, or experimental methods; rather, it provides an analytical and interpretative understanding of the existing body of knowledge and identifies future directions for research and practice.

8. Major OER and MOOC Initiatives in India, National Digital Library of India (NDLI)

8.1 SWAYAM

SWAYAM is India's flagship MOOC platform offering courses across disciplines from school to postgraduate levels.

In India, digital education initiatives have accelerated following government interventions. The National Education Policy (NEP) 2020 underscores the importance of technology-enabled learning and digital platforms in improving access and quality (Ministry of Education, 2020). The policy promotes open learning ecosystems, blended instruction, and credit transfer mechanisms through platforms such as SWAYAM.

A study by Mishra and Singh (2017) examined the implementation of MOOCs in India and found that government-supported platforms have significantly expanded access to higher education, particularly in remote regions. However, infrastructural limitations and digital literacy gaps remain persistent challenges.

8.2 National Programme on Technology Enhanced Learning (NPTEL)

- (i) NPTEL was launched in 2003 by the Ministry of Education and is jointly managed by the IITs and IISc Bengaluru to improve the quality of technical and higher education in India.
- (ii) It offers free online courses in engineering, science, technology,

management, humanities, artificial intelligence, data science, and other emerging disciplines through video lectures, assignments, and learning materials.

(iii) Learners can earn UGC- and AICTE-recognized certificates by completing online assessments and proctored examinations, with credits transferable under the National Education Policy (NEP) 2020.

(iv) NPTEL supports faculty development, skill enhancement, and lifelong learning by providing high-quality educational resources for students, teachers, researchers, and working professionals.

(v) As one of India's largest MOOC platforms, NPTEL has significantly strengthened digital education by promoting accessible, affordable, and quality higher education across the country.

8.3 e-PG Pathshala

(i) e-PG Pathshala is an initiative of the Ministry of Education under the National Mission on Education through ICT (NMEICT) to provide quality postgraduate learning resources.

(ii) It offers curriculum-based study

materials in more than 70 postgraduate disciplines, including Library and Information Science, Commerce, Social Sciences, Humanities, and Sciences.

(iii) The learning modules include self-learning text, video lectures, quizzes, assignments, references, and additional learning resources, prepared by experts from leading universities.

(iv) The platform promotes self-paced and blended learning by providing free online access to standardized and high-quality educational content.

(v) e-PG Pathshala contributes to improving the quality of postgraduate education by supporting students, teachers, and researchers across Indian universities.

8.4 National Digital Library of India (NDLI)

➤ The National Digital Library of India (NDLI), developed by IIT Kharagpur, is a national digital repository that provides free access to millions of educational resources.

➤ NDLI contains books, journals, theses, dissertations, lecture notes, videos, question papers, and other digital learning resources covering all academic disciplines.

➤ It serves students, teachers, researchers,

professionals, and lifelong learners through a single-window search platform.

- The platform supports multilingual learning, advanced search facilities, and remote access, thereby improving educational accessibility and resource discovery.
- NDLI strengthens India's digital education ecosystem by promoting equitable access to quality educational and research resources.

8.5 e-GyanKosh

- e-GyanKosh is the digital repository of Indira Gandhi National Open University (IGNOU), developed to preserve and disseminate educational resources for open and distance learning.
- It provides free access to self-learning materials, audio and video lectures, assignments, dissertations, project reports, and other digital learning resources.
- The repository supports students, teachers, researchers, and distance learners by providing quality educational content in digital format.
- e-GyanKosh promotes lifelong learning and knowledge sharing through

organized digital preservation and easy retrieval of academic resources.

- It has become one of India's leading digital repositories, significantly supporting open, flexible, and distance education initiatives.

8.6 National Repository of Open Educational Resources (NROER)

- The National Repository of Open Educational Resources (NROER) was developed by CIET, NCERT, to provide openly licensed educational resources for teachers and learners.
- It hosts a wide range of textbooks, videos, animations, audio lectures, images, simulations, and interactive learning materials across various subjects.
- Educational resources are available under open licences, allowing users to freely access, reuse, adapt, and redistribute learning materials.
- NROER supports multilingual education, digital classrooms, blended learning, and inclusive education by making quality resources freely available.
- The repository plays a significant role in promoting the Open Education

movement in India by enhancing equitable access to quality educational resources and encouraging collaborative content development.

9. Impact of OER and MOOC on Higher Education

OER has significantly enhanced accessibility to learning resources while reducing educational costs. The availability of freely accessible learning materials supports equitable education and improves opportunities for disadvantaged learners. OER also enables faculty members to customize instructional materials according to local needs and learner diversity. Furthermore, OER promotes collaborative learning, curriculum innovation, and academic resource sharing among institutions.

MOOCs have expanded learning opportunities by providing flexible and self-paced education. They support lifelong learning, professional development, and employability enhancement. During the COVID-19 pandemic, MOOCs played a critical role in ensuring continuity of education. Credit transfer mechanisms under UGC regulations have further strengthened their integration into formal higher education. India's open learning ecosystem comprises multiple parallel initiatives including OER

repositories like the National Digital Library (NDL), e-GyanKosh, and e-PG Patshala, which house thousands of curated learning artifacts accessible without financial barriers. These resources provide foundational knowledge, supplement classroom instruction, and support self-directed learning for diverse learner groups.

10. Role of Academic Libraries: Academic libraries play a strategic role in promoting OER and MOOCs through:

Academic libraries play a crucial role in facilitating the adoption of OER and MOOCs. Corral (2012) emphasized that librarians have expanded responsibilities in supporting scholarly communication, digital learning, and knowledge dissemination.

Libraries assist in curating open educational content, providing OER website link in their library website developing institutional repositories, promoting information literacy, and providing guidance on copyright and licensing issues. Vidya (2022) observed that academic libraries in India are increasingly contributing to OER awareness and accessibility, thereby supporting open learning ecosystems.

- (i) Supporting institutional repositories.
- (ii) Promoting information and digital

literacy.

- (iii) Providing copyright and licensing guidance.
- (iv) Facilitating access to digital learning platforms.
- (v) Conducting awareness and training programmes.

11. Challenges

Despite their advantages, OER and MOOCs face several limitations.

- (i) Limited internet connectivity in rural regions.
- (ii) Digital divide and inadequate infrastructure: The digital divide remains a critical barrier to the effective adoption of OER and MOOCs in India. Limited internet connectivity, inadequate digital infrastructure, and unequal access to digital devices, particularly in rural and remote areas, restrict equitable participation in online education (Telecom Regulatory Authority of India, 2022; Ministry of Education, 2020).
- (iii) Language and localisation issues: India's linguistic diversity presents a significant challenge for OER and MOOCs, as the predominance of English-language content limits participation among learners from regional language

backgrounds. Developing multilingual and culturally relevant learning resources is essential to ensure inclusive and equitable access to digital education (UNESCO, 2019; Ministry of Education, 2020).

- (iv) Lack of awareness among faculty members: Many faculty members have limited awareness and insufficient training in the effective use, creation, and integration of Open Educational Resources (OER) and MOOCs into teaching and learning practices, which restricts their widespread adoption in higher education (Kumar & Thakur, 2018).
- (v) Quality assurance concerns: Ensuring the academic quality, accuracy, credibility, copyright compliance, and regular updating of OER and MOOC content remains a major challenge for higher education institutions (Butcher, 2015; UNESCO, 2019).
- (vi) Low completion rates in MOOCs: Although MOOCs attract millions of learners worldwide, completion rates remain low because of limited learner motivation, inadequate interaction, time constraints, and insufficient academic

support (Daniel, 2012; **follows**

Liyanagunawardena et al., 2013).

- (vii) Resistance to technological change: Resistance among educators and institutions toward adopting digital technologies and innovative teaching methods often slows the effective implementation of OER and MOOCs in higher education (Hollands & Tirthali, 2014; Mishra & Singh, 2017).

12. Outcomes emerging from the literature

Review of the existing literature indicates that Open Educational Resources (OER) and Massive Open Online Courses (MOOCs) have emerged as significant instruments for transforming higher education in India. The literature consistently highlights that these initiatives contribute to improving access, affordability, flexibility, and inclusiveness in education, particularly for learners from rural, remote, and economically disadvantaged backgrounds. Government-supported platforms such as SWAYAM, NPTEL, e-PG Pathshala, and the National Digital Library of India have substantially expanded the availability of quality digital learning resources and online courses across disciplines.

12.1 Major outcomes of the study is as

- (i) Enhanced Access to Education: OER and MOOCs have reduced geographical and financial barriers, enabling a larger section of the population to access quality higher education.
- (ii) Promotion of Lifelong Learning: The flexibility of MOOCs supports continuous learning, professional development, and reskilling among students, teachers, and working professionals.
- (iii) Cost Reduction: OER provide free and openly licensed educational materials, reducing dependence on expensive textbooks and proprietary learning resources.
- (iv) Support for Blended Learning: Higher education institutions are increasingly integrating MOOCs and OER into classroom teaching, thereby strengthening blended and online learning models.
- (v) Growing Policy Support: The National Education Policy (NEP) 2020 and UGC guidelines have encouraged the adoption of digital and open learning approaches in higher education.
- (vi) Emerging Role of Academic Libraries:

Academic libraries are evolving from traditional information repositories to digital learning support centers by facilitating access to OER, promoting digital literacy, supporting copyright and licensing awareness, and managing institutional repositories.

(vii) Persistent Challenges: The review also reveals several challenges, including the digital divide, inadequate infrastructure, low awareness among faculty and students, language barriers, quality assurance concerns, copyright issues, and low MOOC completion rates.

13. Suggestions: The Study suggests that

- Strengthen digital infrastructure in rural areas.
- Develop multilingual OER and MOOC content.
- Enhance faculty training and capacity building.
- Integrate MOOCs into formal curricula through credit transfer.
- Establish quality assurance mechanisms.
- Strengthen library-led OER support services.
- Encourage institutional collaboration for content development.

- Train the Librarians to adopt new technologies and its application in libraries.

14. Future prospects

The future of OER and MOOCs in Indian higher education appears promising, particularly in the context of NEP 2020. Expanding multilingual content, improving digital infrastructure, strengthening quality assurance mechanisms, and fostering collaborations among institutions can further enhance their impact.

With sustained policy support and institutional commitment, OER and MOOCs can contribute significantly to achieving inclusive, flexible, and quality higher education in India.

15. Conclusion

The study concludes that OER and MOOCs possess strong potential to democratize higher education in India. However, their long-term effectiveness depends on strengthening digital infrastructure, enhancing user awareness and digital competencies, developing multilingual content, ensuring quality standards, and actively involving academic libraries in open education initiatives. The literature therefore points toward the need for a collaborative ecosystem involving policymakers, higher education institutions, faculty members, and

academic libraries to maximize the educational benefits of OER and MOOCs in India.

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