



## A Bird's-Eye View of Open Educational Resources Projects in India

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### Abstract

India has been actively engaging in the Open Educational Resources (OER) movement to enhance access to quality educational content, particularly in higher education and school education. These efforts are largely supported by government initiatives, academic institutions, and non-profit organizations. Over 1,000 professionals and educators have contributed to the development of these courses, with 10 National Coordinators designated for quality content through SWAYAM. NDLI is a virtual repository of educational resources funded by the Ministry of Education, Government of India, under its NMEICT. e-PG Pathshala is a UGC-funded website for postgraduate-level Open Educational Resources across various fields. DIKSHA is an educational portal featuring digital textbooks, educator training, and interactive content in accordance with NCERT standards. NROER is a compilation of educational materials for school education, covering various disciplines, grade levels, and languages. VIDWAN is a database of profiles of scientists, researchers, and faculty members affiliated with prominent academic institutions and research and development organizations in India. Shodhganga is a project promoting open access to research, increasing exposure of academic work, and facilitating the progress of knowledge. NPTEL offers free online courses in various engineering, scientific, and humanities disciplines. eGyankosh is a digital repository created by the Indira Gandhi National Open University (IGNOU) in India.

**Keywords:** Open Educational Resources (OER), India, Digital Learning, Educational Initiatives, Higher Education.

### 1. Introduction

Open Educational Resources (OER) are free teaching and learning materials that can be accessed, used, and modified by anyone. These resources, such as textbooks, quizzes, and videos, are popular due to their cost-effectiveness, ability to democratize education, and potential to provide equal opportunities for learners worldwide. Implementing OER requires careful planning, identifying resources, customization, and developing guidelines. OER offers advantages such as cost savings, access to education, and collaboration, but also has disadvantages like quality control, lack of support, and copyright issues. The future of OER looks promising as more organizations invest in these resources and technology advancements make it easier to access and distribute them. The Recommendation on OER, adopted by UNESCO's General Conference in 2019, is the first international normative instrument to embrace openly licensed educational materials and technologies in education. The OER Dynamic Coalition aims to support Member States in implementing the 2019 Recommendation on OER, focusing on building stakeholder capacity, developing supportive policies, encouraging inclusive and equitable quality OER, nurturing sustainability models, and facilitating

international cooperation.

### 2. Swayam (<https://swayam.gov.in>)

SWAYAM is a program launched by the Indian government to provide optimal educational resources to all, including the most disadvantaged individuals. It aims to close the digital gap and provide access to education through a platform that hosts all courses, from Class 9 to post-graduation, accessible at any time and place. The courses consist of video lectures, curated reading materials, self-assessment tests via quizzes, and an online discussion forum. Over 1,000 professionals and educators from across the country have contributed to the development of these courses. To ensure the production and delivery of superior quality content, 10 National Coordinators have been designated, including AICTE, NPTEL, UGC, CEC, NCERT, NIOS, IGNOU, IIMB, NITTTR, and Institutes of National Importance. Courses offered by SWAYAM are accessible to learners at no cost, but those seeking a certificate must register for final proctored examinations and attend in person at designated venues. Institutions of higher education that authorize credit transfer for these courses can use the grades or certificates earned in these courses accordingly. The UGC has promulgated the UGC (Credit Framework for

Online Learning Courses through SWAYAM) Regulation 2016, instructing universities to select courses eligible for credit transfer.

### 3. National Digital Library of India (NDLI) (<https://ndl.iitkgp.ac.in>)

The National Digital Library of India (NDLI) is a virtual repository of educational resources, funded and supervised by the Ministry of Education, Government of India, under its National Mission on Education through Information and Communication Technology (NMEICT). It offers filtered and federated searching to provide targeted searching, allowing learners to locate appropriate resources with minimal effort and time. NDLI caters to various user groups, including examination preparation for school and college students, job seekers, researchers, and general learners. It is engineered to accommodate material in any language and offers interface support for the ten most prevalent Indian languages.

The project began as a pilot (NDLI Phase I) in April 2015 and concluded on 30th September 2017. Phase II began on 1st October 2017 and concluded on 31st March 2020, but the COVID-19 pandemic prolonged this phase until 31st March 2021. The Ministry of Education, Government of India, initiated Phase III from 1st April 2021 to 31st March 2026.

The NDLI Portal was officially inaugurated on June 19, 2018, with the fundamental objective of consolidating major Indian digital and non-digital libraries into a unified platform, guaranteeing accessibility to educational resources for all. The project has seen significant growth, with the launch of new project websites, digital libraries, career development and recruitment divisions, and mobile applications. The NDLI India mobile application received the mBillionth Awards in August 2017, and Phase II KEDL 2017 was initiated in October 2016. The portal has since been released to educational institutions and continues to grow and improve.

### 4. e-PG Pathshala (<https://epgp.inflibnet.ac.in>)

e-PG Pathshala is a UGC-funded website for postgraduate-level Open Educational Resources across various fields. It is a project of the Ministry of Human Resource Development (MHRD) under the National Mission on Education through Information and Communication Technology (NME-ICT), implemented by the University Grants Commission (UGC). The content is developed in 70 subjects across social sciences, arts, fine arts, humanities, natural and mathematical sciences, linguistics, and languages by subject experts from Indian universities and research institutes nationwide. The site aims to deliver accessible, high-quality electronic content for postgraduate students across various disciplines, including social sciences, humanities, arts, natural sciences, linguistics, and languages. The UGC, in collaboration with other educational institutions, creates and sustains the e-PG Pathshala portal.

#### Here is a Comprehensive Analysis:

- **Objective:** To deliver accessible, high-quality electronic content for postgraduate students across several disciplines.
- **Subject Matter:** Comprises electronic texts, multimedia materials, and interactive components to augment learning.
- **Extent:** Encompasses several fields, including social sciences, humanities, arts, natural sciences, linguistics, and languages.
- **Intended Audience:** Primarily intended for postgraduate

students, but also available to faculty members and researchers.

- **Execution:** The UGC, in conjunction with other educational institutions, creates and sustains the e-PG Pathshala portal.
- **Accessibility:** The portal is accessible online and offers complimentary access to electronic information.
- **Advantages:** Facilitates access to high-quality educational materials, particularly for pupils in distant or under-resourced regions

### 5. DIKSHA (<https://diksha.gov.in>)

DIKSHA (Digital Infrastructure for Knowledge Sharing) is an educational portal featuring digital textbooks, educator training, and interactive content in accordance with NCERT standards. Established in 2017, DIKSHA is accessible to learners and educators nationwide and accommodates 36 Indian languages. Each State/UT uses the platform uniquely, exercising autonomy to develop and implement programs for educators, students, and administrators. DIKSHA policies and tools enable the education ecosystem to engage, contribute, and utilize a unified platform to attain nationwide learning objectives at scale. DIKSHA is constructed on open-source technology, developed in India for India, integrating internet-scale technologies and facilitating many use cases and solutions for education. The Honourable Prime Minister of India inaugurated NDEAR (National Digital Education Architecture) on 29th July 2021, which offers foundational components for the creation of federated and interoperable systems by States and Union Territories.

During the COVID-19 epidemic, DIKSHA experienced an extraordinary increase in access by learners and educators. A comprehensive library of diverse materials was provided by schools, individual educators, content partners, NGOs, and corporations through CSR initiatives under VidyaDaan. A substantial collection of audiobooks, Indian Sign Language (ISL) videos, and dictionaries has been made accessible to DIKSHA to support the education of Children with Special Needs (CWSN). NCERT provides educational information for pupils continuously via PM eVIDYA DTH-TV channels, offering class-specific content connected to DIKSHA via QR codes.

### 6. NROER (<https://nroer.gov.in>) integrated with DIKSHA

The National Repository of Open Educational Materials (NROER) is a portal managed by the Ministry of Education (MoE) that provides a compilation of educational materials for school education, covering various disciplines, grade levels, and languages. It was initiated in 2013 by the Department of School Education and Literacy, Ministry of Human Resource Development, and the Central Institute of Educational Technology, National Council of Educational Research and Training. NROER offers an extensive array of educational resources, including textbooks, study aids, and multimedia content. It is accessible in multiple languages and can be accessed in various media formats. NROER functions as a cooperative platform for teachers, educators, and those interested in school and teacher education. The materials facilitate adaptable learning and enable students to engage at their own speed and convenience. The platform aims to engage underserved students and institutions. NROER has developed into a course creation system (CMS) and a course delivery platform (LMS).

## 7. VIDWAN (<https://vidwan.inflibnet.ac.in>)

VIDWAN is a database of profiles of scientists, researchers, and faculty members affiliated with prominent academic institutions and research and development organizations in India. It provides essential details on the expert's history, contact information, experience, academic publications, abilities, achievements, and researcher identity. The database is produced and maintained by the Information and Library Network Centre (INFLIBNET) with financial backing from the National Mission on Education through ICT (NME-ICT). VIDWAN is crucial for the selection of expert panels for various committees and task forces constituted by the Ministries or Government institutions for oversight and assessment reasons. The platform functions as a centralized library of profiles for researchers and academics across many disciplines in India. Each profile has essential information about the expert, including personal information and contact data, educational credentials and vocational experience, domains of proficiency, academic publications, awards, distinctions, fellowships attained, conducted research projects, professional associations and memberships, and connections to their academic profiles such as ORCID, Google Scholar, Scopus, and Web of Science.

The objectives of VIDWAN are to efficiently and effectively provide information on specialists to colleagues, potential partners, funding organizations, policymakers, and research academics. It also assists in the identification of peer reviewers for papers and research proposals, identify prospective colleagues for current research initiatives, facilitate direct connection with specialists who hold the requisite knowledge, facilitate networking and information sharing possibilities among researchers, and improve the clarity of the procedure by which specialists are solicited to engage in diverse scientific endeavors.

## 8. Shodhganga (<https://shodhganga.inflibnet.ac.in>)

Shodhganga is a project in India aimed at promoting open access to research, increasing the exposure of academic work, and facilitating the progress of knowledge. Theses and dissertations are recognized as valuable and distinctive sources of knowledge, often serving as the sole repository of research that does not enter numerous publication avenues. Theses and dissertations are an underutilised resource, resulting in wasteful duplication and repetition, which contradicts the principles of research and leads to significant waste of both human and financial resources. The UGC Notification (Minimum Standards & Procedure for Award of M.Phil./Ph.D. Degree, Regulation, 2009 Amendment 2016) dated May 5, 2016, requires researchers in universities to submit electronic versions of theses and dissertations to promote open access to Indian academic works globally. The online distribution of electronic theses via centrally-maintained digital repositories not only facilitates simple access and storage of Indian doctoral theses but also enhances the standard and quality of research.

Shodhganga offers a platform for research researchers to archive their Ph.D. theses and disseminate them to the academic community through open access. The repository can capture, index, store, disseminate, and preserve Electronic Theses and Dissertations (ETDs) submitted by researchers. The INFLIBNET Centre advocates for the establishment of institutional and ETD repositories in member institutions using OAI-PMH compliant software.

Shodhganga mirrors the academic framework of each university by categorizing its Departments, Centres, and Colleges to enhance navigational efficiency. The Centre is

building a semantic web interface to enhance subject-based browsing, navigation, search, and retrieval of material in the repository. Shodhganga is a comprehensive, continuously expanding digital repository dedicated to Indian research outputs, encompassing PhD theses and MPhil dissertations. It functions as a national repository of Indian intellectual output, facilitating access to research undertaken in Indian institutions for the worldwide academic community. As of April 2024, it had about 531,000 theses from 770 participating universities. Advantages for researchers include a platform for researchers to store and communicate their work, enhancing its visibility and potential influence. Additionally, it assists institutions in adhering to UGC regulations and presenting their research findings to a broader audience.

## 9. NPTEL (<https://nptel.ac.in>)

NPTEL, a collaboration between the Indian Institutes of Technology (IITs) and the Indian Institute of Science (IISc), offers free, online courses in various engineering, scientific, and humanities disciplines. The initiative is financed by the Ministry of Education (MoE) of the Government of India. NPTEL provides a wide range of courses, including engineering and technology, fundamental sciences, humanities and social sciences, administration, health sciences, architectural design, legislation, and economics. Most courses are offered at no cost, and certifications can be obtained after successful completion through a proctored in-person examination. The certifications are conferred by the IITs/IISc and can enhance the value of a resume.

NPTEL courses are available on the SWAYAM platform, the official online learning platform of the Ministry of Education. Courses can be accessed through the SWAYAM portal or the NPTEL website. NPTEL is known for its extensive online repository, premium content, accessibility, self-directed learning, and certification and recognition. It has established Local Chapters at several institutions to enhance online learning. Certification course examinations are administered in person at specified examination centers, lasting three hours and involving multiple-choice enquiries, numerical tasks, and subjective enquiries. Hall tickets are available for download a few weeks before the exam date, and exam registration has deadlines. NPTEL serves as a valuable resource for students, instructors, and professionals seeking to acquire new skills and obtain certifications from India's leading educational institutions via online courses.

## 10. eGyankosh (<https://egyankosh.ac.in/>)

eGyankosh is a digital repository created by the Indira Gandhi National Open University (IGNOU) in India, serving as a central hub for storing, indexing, preserving, distributing, and sharing digital learning resources developed by Open and Distance Learning Institutions (ODLIs) across the country. It acts as a large online library of educational materials, including self-instructional study material, audio/visual programs, and archives of radio and television-based live interactive sessions. Developed by IGNOU in 2005, it focuses on resources created by ODLIs in India. eGyankosh stores and organizes a wide range of digital learning resources, ensuring their long-term preservation for future use. It also enables easy access and sharing of learning materials across the country. Key features include diverse formats, copyright protection, various communities, and various communities like IGNOU FB Live Recorded Videos, IGNOU Self Learning Material (SLM), IGNOU-SWAYAM Course Content, IGNOU YouTube Videos, the Indian Journal of Open Learning (IJOL), and university publications.



### 11. IIT Bombay Open Courseware (<https://www.cdeep.iitb.ac.in/>)

IIT Bombay Open Courseware, primarily available on platforms like edX and Coursera, offers access to IIT Bombay's courses and resources to a global audience. It offers both free and paid options, with some courses offering verified certificates for a fee. Key features include free access to courses and materials, auditing options, and a wide range of subjects including engineering, science, technology, management, and design. IIT Bombay uses various teaching methods, including hybrid MOOCs, live interactions, online lectures, and flipped classrooms. The Centre for Distance Engineering Education Programme (CDEEP) offers distance education courses, while the National Programme on Technology Enhanced Learning (NPTEL) develops online learning materials for undergraduate engineering courses. Live courses are broadcasted from IIT Bombay studios and can be accessed globally. Examples of Open Courseware include LaTeX for Students, Engineers, and Scientists, Shell Programming, Object-Oriented Programming, Design Thinking and Innovation, Introduction to Business Management, and Introduction to the Internet of Things.

### 12. Agropedia (<http://agropedia.iitk.ac.in>)

Agropedia is an online agricultural knowledge repository, akin to an "agricultural Wikipedia," that provides accessible and open-access information about agriculture to various stakeholders, including farmers, researchers, and extension personnel. The platform is backed by the Indian Council of Agricultural Research (ICAR) and sponsored by the World Bank. It houses a wide range of agricultural information on various crops and practices, organized using knowledge models and visual representations. Agropedia also serves as a social networking platform, facilitating interaction and knowledge sharing among users. It offers content in multiple languages and provides various mechanisms for delivering information to different stakeholders. Agropedia's purpose is to empower farmers with knowledge and information to make informed decisions about their crops and farming practices. It also facilitates agricultural extension by sharing information and best practices with farmers. Agropedia promotes knowledge sharing among scientists, researchers, and the agricultural community, utilizing ICT technologies to organize and distribute agricultural knowledge effectively.

### 13. CK-12 Foundation (<https://www.ck12.org/student/>)

CK-12 Foundation is a non-profit organization that provides free, open-source educational materials, including textbooks, Flexbooks, and lesson plans, for various subjects and grade levels, including adaptations for India. These materials are adaptable and can be customized by educators to fit their curriculum and learning needs. CK-12 Flexbooks are flexible, allowing educators to customize content and add their own resources to suit their students and curriculum. They are a leading provider of Open Educational Resources (OER) in K-12 education, offering free and adaptable content for a wider range of students and teachers. CK-12's Flexbooks can be customized to align with the Indian curriculum, such as the CBSE syllabus, as evidenced by the availability of resources specifically labeled as "CK-12 CBSE." CK-12 Flexbooks cover various topics, including habitat and adaptations relevant to the Indian curriculum. Benefits of using CK-12 include cost-effectiveness, flexibility and customization, and accessibility, as online resources can be accessed from anywhere with an internet connection. Overall, CK-12 Foundation offers a valuable resource for K-12 education in

India by offering flexible, adaptable, and free educational materials tailored to the specific needs of the Indian curriculum and learning context.

### 14. eBasta (<https://www.india.gov.in/ebasta-portal>)

eBasta is a digital educational repository and framework, part of India's Digital India initiative, that provides school textbooks and other educational resources in digital form as eBooks. It aims to bring together publishers, schools, and students on a single platform for easy access and management of educational materials. eBasta allows teachers to organize resources into pedagogically relevant "bastas" for students, streamlining access and reducing reliance on physical books. Key features include digital accessibility, a centralized platform for sharing and accessing e-content, organized "bastas," convenience for students, reduced burden of physical books, enhanced learning, cost-effectiveness, and teacher training and support. Publishers can upload their e-content to the eBasta portal, providing information like class, language, subject, price, and previews. Schools and teachers can browse the portal, select and organize content, and access and download the "bastas" created by their schools. An Android app is available to help students and teachers access and manage content downloaded through the eBasta portal.

### 15. Conclusion

OER (Open Educational Resources) is a future where students and instructors have free access to high-quality, collaboratively developed resources. OER allows for easy adaptation to specific courses and student needs, and lower costs for creation, use, and maintenance compared to textbooks. However, finding and creating OER can be time-consuming and requires effort. OER formats are primarily targeted at high-enrollment courses, potentially saving costs for students. There are many open textbooks available, but fewer options for ancillary materials. Instructors face time constraints, but resources are available to help locate, adopt, and implement OER.

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