Embracing diversity in ASIA through the adoption of Inclusive Open Practices

618615-EPP-1-2020-1-UKEPPKA2-CBHEJP

WP2 – Development

D2.1a– Best Practices for the Development of Accessible OERs to Support Inclusion in India

A White Paper

Version – Final

WP Lead – NTU

Contributors: **IITB (Indian Institute of Technology Bhubaneswar, P2) and VIT (Vellore Institute of Technology, P3)**

Edited and Compiled by NTU

Contents

Best Practices for the Development of Accessible OERs to Support Inclusion

OER Accessibility within open educational resources and practices for disabled learners.

In the dynamic landscape of modern education, where accessibility, affordability, and quality are the primary concerns, Open Education Resources (OERs) have emerged as a powerful force to revolutionise the learning across the globe. In the Indian context, the importance of OERs cannot be overstated due to the country's populous and diverse educational system. OERs are defined by their open licensing and unrestricted accessibility, which exemplify the values of information democratization, equitable access, and collaborative learning.

OERs are defined as "any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt, and re-share them. OERs include learning content, software tools to develop, use, and distribute content, and implementation resources such as open licenses" [UNESCO, 2011]. Creative Commons define OERs as any learning and teaching materials which are available as open license and freely adaptable and distributable for anyone. Open Educational Practices (OEP) is the term used to describe the use of OERs within a pedagogical framework that emphasizes innovation and collaboration [Zhang et al., 2020]. India's commitment to provide education to all, as stated in its Constitution, aligns well with the principles of OERs.

In a nation where a significant number of individuals desire to acquire knowledge and attain success, the OER movement presents the potential to enhance the inclusivity, affordability, and adaptability of education to cater to a wide range of requirements and backgrounds. The incorporation of OERs into India's educational system poses several opportunities and problems, given its unique position at the intersection of tradition and innovation. The significance of OERs in expanding the reach of higher education has been emphasized by the National Knowledge Commission in 2007. It has been proposed that the establishment of a National Educational Foundation, with a sufficient one-time allocation of funding, is necessary to create an online repository of educational resources of exceptional quality. The development of OERs necessitates an online collaborative approach that involves the collective contributions and skills of prominent higher education institutions [Balouva, 2020].

The OERs repository would provide educational software for diverse programs implemented in the context of Open Distance Education (ODE), and it would be accessible for utilization by all institutions engaged in ODE. In order to achieve this objective, it is imperative to develop a comprehensive legal framework that facilitates unimpeded access while safeguarding intellectual originality. OERs provide a multitude of benefits for learners, educators, institutions, and society at large. The following are some of the notable benefits associated with OERs:

- Cost savings: OERs are usually free, so students don't need to buy textbooks or course materials. This makes education cheaper to access.
- Quality Content: Expert-created textbooks, videos, interactive simulations, and more are available through OERs. This gives students current, reliable information.
- Customization and Adaptation: Teachers can customize OERs to meet their needs and the needs of their students. This flexibility makes instruction more individualized and effective.

- Global Collaboration: OERs promote educator-institution collaboration worldwide. Teachers may share materials, best practices, and knowledge to build community and innovate education.
- Accessibility: OERs are easily distributed and accessed online, making them available to learners worldwide. This helps rural or underserved populations.
- Innovation and Experimentation: OERs can support teaching and learning innovation. Without textbooks, teachers can try new methods, and technologies.
- Lifelong Learning: OERs provide a plethora of materials for formal education, personal development, and professional success.
- Reduced Environmental Impact: Many OERs are digital, reducing the demand for printed materials and education's environmental impact.
- Pedagogical Advancements: Because educators can choose and customize resources to fit their pedagogical style, OERs can foster learner-centred and active learning.
- Data and Analytics: Digital OERs can help collect student content engagement data. Both teaching and content design can benefit from the use of this data.
- Fostering Open Education Ecosystems: OER projects typically create open education ecosystems that benefit governments, educational institutions, and students.

In the context of OERs, educational resources are created within an open environment, allowing for their enhancement through the collective efforts of a diverse community of educators. Consequently, this collaborative process fosters pedagogical advancements and the emergence of novel and successful teaching methodologies. Additionally, it affords learners and educators the ability to become acquainted with extensive knowledge that has not previously been incorporated into educational contexts. OERs also enhance the accessibility of superior learning materials by sharing the expenses associated with content development across a vast number of users. OERs possess the potential to enable novel approaches to teaching and learning through the provision of opportunities for the modification and assembly of open resources in distinctive ways.

This paper provides a thorough investigation into the current status of OERs in India. This study explores current initiatives and the transformative possibilities of OERs within the Indian setting. It also examines the influence and significance of OERs across diverse educational sectors, with the objective of highlighting the transformative role of OERs in the advancement of learning and instruction in India.

A Review of relevant papers and policies for OER use in India

Guidelines for Development of eContent for School & Teacher Education

This paper developed by the Department of School Education and Literacy [Department of School Education & Literacy, nd] provides guidelines for the creation of e-content for teacher and school education.

The paper highlights guidelines for Developing eContent for school and teacher education. Careful planning and consideration of various factors is required to ensure that the content is effective, engaging, and aligned with educational goals. The guidelines addressed cover:

- Needs of Assessment: Determine student and instructor learning goals.
- Curriculum Match: Make sure eContent matches school curriculum and standards. It should assist classroom instruction and help teachers deliver the curriculum.
- User-Friendly Design: Create eContent that is easy to use and accessible to students and teachers of all technology levels.
- Personalization: Let students and teachers customize their learning experience to their needs and requirements.

If implemented correctly, digital learning materials have the potential to greatly enhance both the efficiency of education and the quality of the learning experience. This strategy provides a systematic process for assessing student requirements and creating a curriculum. Educators can choose from a wide variety of proven instructional design methods.

By these principles, educational institutions and content developers can contribute to the evolution of modern education, ensuring that it remains dynamic, accessible, and responsive to the learners and educators. The development of eContent for school education and teacher training is a journey towards an enriched and empowered educational ecosystem. By following these guidelines, stakeholders can navigate this journey with confidence, knowing that their eContent endeavours are guided by best practices and a commitment to educational excellence. Ultimately, the successful implementation of these guidelines will result in a more engaging, effective, and inclusive educational experience for all.

OER for Skills Development

This document [Commonwealth of Learning, 2023] discusses OER for Skills Development. OERs offer affordable, adaptable learning materials for a variety of skill areas, making them particularly useful for skills development. Learning Technical Skills: OER offers tutorials, interactive tools, and instructional materials for programming, web development, data analysis, and graphic design.
OERs include things like the use of information and communication technology (ICT) in the classroom, the formulation of policies is helpful to support OER, and the development of courses that address real-world needs by existing materials. For skills development of OER

- Language and Communication: Open textbooks, video lectures, and language learning apps can improve foreign language and corporate communication skills.
- Personal Development and Soft Skills: OER can offer leadership, time management, critical thinking, and emotional intelligence courses, modules, and resources.
- Digital Accessibility: Awareness of accessibility guidelines and best practices to ensure that OER are usable by individuals with disabilities.
- Collaboration Skills: Effective communication and collaboration skills to work with educators, content creators, and other stakeholders. Collaboration tools proficiency for remote teamwork.

For OER skills development the project was developed using 53 institutional OER policies in

the higher education and TVET (Technical and Vocational Education & Training) sectors, has supported the development of 29 further provincial OER policies and guidelines across three countries, and trained approximately 300 educators from over 100 institutions on the use of OERs in the classroom. Access to high-quality education and training for all enables economic development to be made possible using OER-based programs.
Access to high-quality education and training for all residents of the Commonwealth, as well as help in developing economically viable enterprises, is made possible by OER-based programs and resources. Skills are at the heart of this transformation. They enable educators, content creators, and institutions to develop modern education tools that are more inclusive, affordable, and adaptable. By cultivating these skills, the HE sector can collectively work towards a brighter future where knowledge knows no boundaries, and education is a universal right for all.

On OERs for use in computer- based learning and developing e –learning programs.

OERs refer to any materials used for teaching, learning, or research that are either in the public domain or available under an open license that permits free access, use, adaptation, and redistribution by others with few restrictions.
The purpose of OER is to provide uniform guidelines on the use of various Open Educational Resources. The paper [Open Educational Resources] discusses Policies on use of Open Educational Resources (OER).
According to SRIHER's (Sri Ramachandra University's) OER policy (Sri Ramachandra.edu.in) all the university's lecturers are encouraged to create OER on topics that particularly interest them following Four Quadrants, Quadrant 1 provides textual academic content in .doc or.pdf format; quadrant 2 has an actual e-lesson; quadrant 3 includes a self-testing unit; and quadrant 4 offers access to other resources and learning material is recommended when developing OER. The text's narrative structure must be original work.
The graphic designers at Swayam Prabha AV – which is a Channel Providing 80 High Quality Educational Channels through Direct to Home (DTH) (swayamprabha.gov.in) - create original diagrams, pictures, or photographs, or replicate existing ones.
The National Repository of Open Educational Resources(NROER), which is a platform developed by the National Council of Educational Research and Training (NCERT) (https://www.india.gov.in/) includes the possibility for users to share resources with one another, and users to request specific resources. The main objectives of the NROER are:

- To store, preserve and provide access to a variety of digital resources for students and teachers.
- To get the teacher community involved in making digital tools and sharing them.
- To improve the quality of the educational system in India.
- To help teachers make and share teaching and learning materials that are relevant to their students

The main features of NROER are:

- It is accessible to all people who need the resources.
- The resources are available free of cost.
- Multiple resources on particular subjects and topics are available from the same repository.

- Resources can be added in NROER with correct sharable licensing.

Open Educational Resources for K-12 Education in India Central Square Foundation Concept Paper

This document [Central Square Foundation, 2023] discusses Open Educational Resources for K-12 Education in India. The Official Government OER Initiatives policy is grounded in the National Policy of ICT in School Education 2012 and the ICT@ School programme. It makes the content available under an easily understood open license. By creating a framework for the creation and dissemination of instructional materials by all stakeholders, including the State Council of Educational Research and Training (SCERT), State Institute of Educational Technology (SIET), District Institute for Education and Training (DIET), schools, and educators.

For K-12 Education, the state governments have made recommendations such as investing in multiple efforts for ensuring large-scale creation, promotion and use of K-12 education space, and examining open licensing for all governments publishing material. They should release the material under an open license, and follow policy guidelines on creating of educational resources. Some providers, such as SCERT, SIET, DIET, are encouraging schools and teachers to use OERs to create content.

In assessing an educational resource the Four Rs framework is used:

1. Reuse: copy verbatim
2. Revise: adapt and edit
3. Remix: combine with others
4. Redistribute: share with others

The Indian government has funded a number of initiatives that aim to increase access for K-12 Education and use of study materials created through collaboration, such as the NROER mentioned previously, a website where users may work together to create digital content and organize it using idea maps according to K-12 Education.

Web Content Accessibility Guidelines 2.1 Compliance by Indian OERs: An Empirical Study of Swayam and e-PG Path Shal

The paper [Panda & Chakravarty, 2022] discusses compliance with web content accessibility guidelines 2.1 by Indian Open Educational Resources, specifically Swayam and e-PG Path Shal.
It discusses Compliance by Indian OERs, and provides in depth research on the e-PG Path Shala and Swayam Learning Systems. These Indian OERs follow national and international copyright laws, open licensing standards, and accessibility criteria. The system e-PG Path Shal has a user-friendly UI and supports wide array of instructional materials. The e-Path Shal app promotes digital literacy and improves student and teacher learning. The Swayam system is a programme initiated by Government of India and is designed to achieve the three cardinal principles of Education Policy which are access, equity and quality. Indian OER efforts must promote open and accessible education while adding to legal and ethical principles.
In India the National Mission on Education through ICT (NMEICT) was founded to implement a healthy equilibrium between content generation and delivery with the backing of the

Ministry of Human Resources Development (MHRD), Government of India. This objective seeks to establish and expand OER programs all over India.

Compliance of Indian OERs can be determined by:

- Their interoperability: OER materials are more useful and accessible when compatible with LMS and IT platforms
- Monitoring or Evaluating: OER programs should be monitored and evaluated to ensure compliance and effectiveness, and necessary adjustments and improvements should be made.
- Public Access: OERs should be easily accessible and discoverable. OER resources may be hosted and shared via open repositories, websites, or platforms.

Improving the Digital Accessibility of OER: A Reflective Guide

This paper is a reflective guide to increasing the digital accessibility of OERs. The paper [Anestasi, 2020] discusses Improving the Digital Accessibility of OERs.
Improving the digital accessibility of OERs is crucial to ensure that they can be used by a diverse range of learners, including those with disabilities. Digital accessibility involves designing and presenting OER content in a way that makes it usable and understandable by individuals with various disabilities too. There follow some suggestions made to improve the digital accessibility of OERs:

- Use Accessible Document Formats: OER content should be created in HTML, EPUB (Electronic publication), or PDF formats with accessibility tags. It is good to avoid inaccessible formats like text as images.
- Provide Alternative Text for Images: To help screen readers read photos, charts, graphs, and other non-text items, include descriptive alternative text for the images.
- By Using captions and transcripts for multimedia: Include video and audio captions or transcripts to help hearing-impaired users and all learners access content in noisy surroundings
- Provide Clear and Consistent Navigation: Create OER platforms with standardized navigation menu and labelling. Users should be able to easily navigate the content.
- Share Accessibility Statements: Accessibility statements on OER platforms should indicate your commitment to accessibility and include contact information for accessibility enquiries
- Training and Awareness: Building awareness and providing training for content creators, educators, and administrators is a key step in improving accessibility Knowledge is the foundation of change.
- Continuous Improvement: Accessibility is not a one-time task but an ongoing commitment. Regularly reviewing and updating OERs for accessibility ensures that they remain usable and relevant.
- Legal and Ethical Responsibility: Recognize the legal and ethical responsibility of ensuring that all educational materials are accessible. Compliance with disability laws is not only a requirement, but a moral obligation.

Improving the digital accessibility of OERs means empowerment of individuals, breaks down barriers, and creates a more inclusive educational path. Accessibility is not merely a technical challenge, but a great way to show our commitment to the principles of equity, diversity, and inclusion in education.

Open Educational Resources in India for Teaching-Learning – A Utilization Perspective with Reference to The Faculties of Arts And Science Colleges In Puducherry

This paper uses the examples of the faculties of arts and science colleges in Puducherry, and offers a utilization perspective on open educational resources in India for teaching-learning [Thomas 2017].
OERs have gained significant importance in India's education system, providing valuable resources for teaching and learning across various levels of education.

The paper highlights the following OERs for Teaching-Learning:

- Swayam: Swayam, an Indian government programme, provides OER for primary and higher education across several subjects. It offers free online courses, video lectures, and study materials from India's best educational institutions.
- e-PG Path Shala: National Mission on Education through ICT (NME-ICT) initiative e-PG path Shala provides high-quality postgraduate content for numerous disciplines. Electronic books, video lectures, and supplements are included.
- National Digital Library of India (NDLI): The NDLI digital library offers books, articles, videos, and course materials. This platform benefits students and educators.
- NCERT (National Council of Educational Research and Training) OER: OER textbooks, syllabus, and multimedia are available via the National Council of Educational Research and Training (NCERT). Indian schools use these resources extensively.
- NPTEL: The National Programme on Technology Enhanced Learning offers engineering, scientific, and technology OERs. Engineering course video lectures, notes, and assignments are included.

In the year 2008, the Ministry of Human Resource Development (MHRD) was established to facilitate the creation of educational resources for use in higher education across a wide range of disciplines, including the field of technical and vocational education and training (TVET) [Das, 2011]. Das states that OERs hold promise for teaching and development in India. They align with the nation's goals of inclusive and quality education for all and can be a powerful tool for addressing educational challenges. Hence, realizing the full potential of OER in India requires continued commitment from all stakeholders, including government bodies, educational institutions, content creators, and educators. As OER initiatives in India evolve and mature, they have the potential to reshape the educational landscape, making quality education accessible to every corner of the country.

Open Educational Resources (OERs) at European Higher Education Institutions in the Field of Library and Information Science during COVID-19 Pandemic

The need of this paper is open educational resources (OERs) in the field of library and information science at European higher education institutions during the covid- 19 pandemic.
[Milijana, 2023] discusses OERs use in Higher Education Institutions in the Field of Library and Information Science during the COVID-19 Pandemic. OERs were accessible at HEIs across Europe during the COVID-19 pandemic and played a significant role in higher education in that time providing educators and students in the field of Library and Information Science (LIS) with accessible and adaptable resources. Some key reasons for using OERs during the pandemic include:

- Open Textbooks: Many universities and institutions offer open LIS textbooks. These texts cover everything from library science basics to advanced information.
- LIS Repositories: Open-access LIS repositories are available from some institutions. These repositories contain free research papers, theses, and other intellectual works for students and scholars to download or access.
- Online Courses: edX, Coursera, and Open Learn offer free library and information science courses. Students who switched to online learning during the pandemic found these courses helpful.
- Creative Commons Licensed Materials: Many LIS educators used Creative Commons licensing for their teaching resources. This makes resource sharing and adaption easier while respecting copyright.
- Flexibility and Adaptability: OERs offer flexibility in content adaptation. Educators could customize OER materials to suit the specific needs of their courses and students, especially when traditional teaching methods had to be adjusted.
- Global Collaboration: The pandemic highlighted the importance of global collaboration in education. OERs can be shared across borders, fostering international cooperation among educators and institutions.
- Digital Transformation: The pandemic accelerated the digital transformation of education. OERs, often available in digital formats, complemented this shift, promoting digital literacy and technological skills among students and HE staff.

OERs played a significant role in supporting European Higher Education Institutions during the COVID-19 pandemic. They provided access to educational content, reduced costs for students, and encouraged pedagogical innovation. However, it is important to address issues of digital equity to ensure that all students can benefit from OERs effectively. Understanding the dynamics and ever-changing nature of education in emergency situations calls for constant DE (Distance Education) OER optimization.

Open Educational Resources: Opportunities and Challenges

[Hylen, 2006] discusses OER: Opportunities and Challenges. The term "open educational resources" was coined in 2002 at a UNESCO conference. OERs have emerged as a powerful force, offering both opportunities and challenges to educators, learners, institutions, and policymakers. This introduction provides an overview of the opportunities and challenges associated with OER.

According to Hylen, it was hard to provide a reliable assessment of the total number of OER efforts underway in 2006. The availability of OERs outside the classroom was also growing

rapidly. Rice University had founded a project called Connexions (now called OpenStax) which hosted more than 2,800 open learning elements that could be used to form individual lessons or complete courses. OpenStax can now be accessed online from its own URL (https://openstax.org/) and to this day is serving universities worldwide with free access learning content.

Opportunities identified by Hylen (which satnd true today) included:

- Learning content: Courses, course materials, modules, objects, libraries, and journals are all examples of learning content.
- Tools: Applications that facilitate the creation, management, reuse, and distribution of instructional materials.
- Cost Savings: OER reduces the cost of textbooks and other educational resources, which can be a significant financial burden for students. This can make HE more affordable and accessible.

Similarly the identified challenges below were identified, and continue to challenge OER developers today:

- Lack of awareness of copyright issues: Academics were generally unaware of the licensing that supported the exploitation of copyright when media facilitated publication, consumption, and distribution of texts.
- Quality assurance: The survey of existing OER demonstrates related efforts and digital resources. It is unacceptable when educators, students, and self-learners have trouble locating useful materials.
- Digital Divide: While OER provides access to resources online, it assumes that learners have internet access and digital literacy skills.
- Technical Challenges: Creating, sharing, and using OERs may require technical skills and infrastructure that not all educators or students possess. Ensuring user-friendliness is crucial.

Study On Open Educational Resources in Education Discipline from Indian Online Learning Repositories

[Bhattacharyya, 2022] provides an analysis of Indian online learning repositories/OERs in the field of education and discusses OER use in India. India has seen significant growth in the development and adoption of OERs in the field of education. These resources are available through various online learning repositories and platforms. Here are some notable Indian online repositories and sources of OERs in the field of education:

- Shodhganga: While largely a repository for doctorate theses, Shodhganga often contains education research, making it useful for academic researchers.
- Sakshat: This offers textbooks, lecture notes, and e-books in one place. It has educational and pedagogical materials.
- YouTube Channels: Many Indian educators and organizations post educational information, instructional methods, and resources via YouTube and blogs. These resources are usually public.

- Educational Institutions' Websites: Many Indian institutions and colleges, especially those offering education programs, post lecture notes, course materials, and other educational resources on their websites.

International Review of Research in Open and Distributed Learning - an OER Architecture Framework: Needs and Design

[Pankaj & Basak, 2013] present a review of international open and distributed learning research, a framework for OER architecture needs and design and discuss an OER Architecture Framework for needs and design.

The OER movement inspires new approaches to developing instructional materials and other study aids. Many OERs in India have the potential to lower costs without sacrificing quality or access. The Indian distant education system benefits from the OER system. OERs in India have many advantages, including the fact that they are freely availableto use, and give students access to a variety of media formats (including slideshows, pictures, videos, and adapted versions of these formats). This supports India's proposed national education system for ensuring high-quality, accessible distant learning for all students.

A simplified outline of Pankaj & Basak's OER Architecture Framework is summarised below:

- Vision and Objectives: Define the overarching vision and goals for the OER initiative. Identify the specific educational objectives that OERs aim to address, such as improving access, reducing costs, or enhancing learning outcomes.
- Governance and Leadership: Establish governance structures responsible for overseeing the OER initiative. Appoint leadership roles to coordinate and advocate for OER adoption at institutional or organizational levels.
- Content Creation and Curation: Specify processes for creating, curating, and reviewing OER content. Encourage collaboration among educators, subject-matter experts, and content creators.

Emergence of OERs in India and its impact on lifelong learning

[Anup, 2011] discusses the emergence of OERs in India and the impact on lifelong learning. The Indian government's National Knowledge Commission (NKC) actively promotes OER adoption among Indian educational institutions. Many people, especially those living in less developed nations, have benefited from OERs created in India. There follows a list of key reasons for impact of OERs in India on lifelong learning:

- The OER is separated into visual and written formats. Though, there are only a handful of other Indian OER created specifically for K-12 students or IIT/IISC's technical and vocational programs.
- Access to HE and the enhancement of secondary school quality are the goals of the centrally funded scheme in India initiated in 2009.
- The National Knowledge Network (NKN) connected public research on OERs in tertiary institutions for the purpose of knowledge sharing and transfer.

- Library and information science (LIS) experts in India are actively involved in OERs at the national and institutional levels, contributing to the country's rapid growth in this area.

- Access to Quality Education: OERs in India let students of all ages and classes get good educational materials for free. Access to this is especially helpful for people who might not be able to afford to go to a regular school.

- Affordability: OERs make it much easier for students to afford school by letting them get textbooks, training materials, and other materials for free or very little money. This low cost makes learning for life more appealing to more people.

- Flexibility: OERs in India cover a lot of different subjects and topics, so they can meet the needs and interests of a wide range of students. People can learn about many things, such as science, technology, the arts, the humanities, and job skills.

OER Opportunities and challenges for Indian Higher Education

[Dutta, 2016] discusses Open Educational Resources (OER): Opportunities and Challenges for Indian Higher Education Any sort of educational content released under an open license or in the public domain is referred to as an open educational resource (OER). Because these works are in the public domain, anyone can take them and use them anyway they like. Curriculum, syllabi, textbooks, assignments, exams, projects, media files (audio, video, and animation), and more are all examples of OERs. Sharing resources like instructors and course materials while keeping them in the public domain is the goal of Open Educational Resources (OER). The purpose of OERs is to provide free, high-quality educational materials to anyone, wherever in the world.

Indian higher education faces a range of opportunities and challenges that shape its current landscape and future development. These opportunities and challenges are closely intertwined and require careful consideration to ensure the continued growth and improvement of the sector. Here are the following things for OER Opportunities and Challenges for Indian Higher Education:

- Creating ultra-fast internet connections to link India's more than 400 universities and 22,000 institutes of higher education.

- There are around 712 universities, 36,671 colleges, and 11,445 independent managements, technical, medical, and other professional schools that enrol approximately 19% of all people between the ages of 18 and 23. In India, teachers must collaborate, adopt innovative methods, and localize instructional resources.

- Opportunities: Demographic Dividend: India has a large and youthful population, making it a potential global powerhouse for education and workforce development. Leveraging this demographic dividend can lead to a more educated and skilled workforce.

- Digital Transformation: The rapid adoption of digital technologies, especially smartphones and the internet, presents opportunities for online and blended learning, which can reach a wider audience and provide flexible education options.

- Global Collaboration: Opportunities for international collaborations, research partnerships, and faculty/student exchanges can enhance the quality and global

relevance of Indian higher education institutions.

- Research and Innovation: Investment in research and innovation can help Indian universities become global leaders in cutting-edge fields and attract talent and funding from around the world.

Open Educational Resources in India's national development

[Kumar, 2009] discusses the role of OER in the growth of India. Due to the growing number of open access electronic journals, India is emerging as a key player both in the open source software and open access movements. OERs play a significant role in India's national development by contributing to various aspects of education, technology, economic growth, and societal advancement. Here are some ways in which OER supports India's national development:

- In India, there are more than 1.1 billion college graduates with 311 universities and 15,600 colleges as of 2004, India had one of the most robust higher education systems in the world, turning out 2.5 million graduates annually.
- In HE, three or four major OER efforts are work to create OERs for teaching the fundamental sciences and engineering.
- There has been some noteworthy work done in this area, most notably the National Programme on Technology Enhanced Learning. The Indian government's Ministry of Human Resource Development is backing this consortium of seven universities to raise the quality of engineering education in India. The integration of OA and OER materials greatly reduces the cost of educating these students. More people will be able to afford to go to college. Another advantage of OER is that more people have the chance to advance in their careers and earn higher incomes through continued education.

Overall, Kumar states that OERs in India support the nation's development goals by democratizing education, fostering innovation, enhancing digital literacy, and contributing to economic growth and social equity. To maximize these benefits, it is essential for India to continue investing in OER initiatives, promote awareness and adoption, and ensure the quality and relevance of OER materials.

Acceptance and Usability of OER in Indian Higher Education: An Investigation Using UTAUT Model

[Padhi, 2018] discusses Acceptance and Usability of OER in Indian Education, investigating the UTAUT Model Application. In 2008, India made its first official commitment to using OERs in the classroom. The NKC has since agreed to start a "national e-content curriculum initiative" as a result. The objective was for Indian universities to create, adapt, and deploy OERs.

The National Repository of OER (NROER) was established in 2013. Of those who answered all three of the most basic OER questions, 93.1 percent said they were aware of the word, but just 19.8 percent said they had used OERs. Only 8.6 percent were willing to allow OER sharing in their classes, though according to the results, educators are aware of the value of OERs.

They hope to implement OER since they are more efficient and easier to implement. OER

utilization and acceptability cannot progress until these challenges and obstacles are resolved. In conclusion, OERs are recognized as a concept within the context of Indian higher education, but widespread implementation and utilization are yet years away.

Acceptance and Barriers of Open Educational Resources in the Context of Indian Higher Education

[Datt & Singh, 2021] discuss acceptance and barriers of OER of Indian HE. They suggest that educators and students alike can benefit from OERs, which are freely accessible online. OERs have great promise to address both the teacher shortage in the United States and the aspirational gap in educational quality. Using OERs is one strategy for closing the achievement gap and removing a key barrier to high-quality education for all students in the United States.

OERs are more important in the information and communication technology (ICT) era because they change educational landscapes, enhance learning opportunities, cultivate faculty, provide remote access to educational resources, and empower education.

Accessibility within open educational resources and practices for disabled learners: a systematic literature review

[Zhang et al, 2020] discuss Accessibility within OER and practices for disabled learners:

Despite the growing number of OER and the policy attention devoted to OER accessibility, as seen by the inclusion of principles to increase OER accessibility in the Ljubljana OER Action Plan the extent to which OER are truly accessible varies. OERs enable educators to access materials produced by a wide range of writers, including people with disabilities. This helps to normalize and eradicate stigma as well as providing previously unheard views.

Unlike commercially released materials, OERs that have been adapted to fit accessibility criteria can be preserved and freely shared among communities, which helps to reduce unnecessary repetition of work inside and between different institutions. Adopting OERs can reduce costs, which helps all students but especially those with disabilities who are likely to be experiencing financial hardship.

Analysing repositories of OERs using web analytics and accessibility tools

[Perifanou & Economides, 2022] discusses Analyzing repositories of OERs using web analytics and accessibility tools: By making it possible for students of all socioeconomic backgrounds to access high-quality educational materials at no cost, OERs have the potential to reduce educational inequalities.

Open educational resources have the potential to foster global dialogue and information exchange. When developing OERs, designing curriculum, syllabi, and lesson plans based on OER, and delivering instruction using OERs, authors and educators from different countries can work together. They can adapt OERs to fit their specific needs and circumstances. It can be concluded that many people from all over the world will visit a prosperous Repository of Open Educational Resources (ROER). One way to accomplish this is by the curation of a large number of high-quality, useful, and easily-accessible OERs across a wide range of subjects and languages.

In addition, the site should be mobile-friendly and devoid of errors, violations, alerts, warnings, and other issues that could hinder accessibility, and should be capable of receiving a significant amount of traffic from reliable domains and links. To achieve these aims, the ROER must be well-known, have an easy-to-remember URL, and gather a large quantity of useful, high-quality, and readily available OERs for a wide variety of academic disciplines.

Current Initiatives and Challenges to OERs in Indian Higher Education

[Bansal, 2022] discusses Current initiatives and challenges to OERs in Indian higher education. While OERs can be used to generate and disseminate content, some may not be utilized to award credentials or to assist students in their educational or administrative pursuits. Open and distant education however, are beginning to employ OER materials.

Some OER authors have taken to social media in an effort to spread the word about their work and to gain more exposure. There are some excellent Indian institutions, but they are vastly overwhelmed by weaker ones that have failed to keep up with the technological revolution that has swept the Indian economy in recent decades. That is why major advancements by the Indian government are so important. Below we highlight some of the challenges to OER use in the Indian HE System:

- Technological Infrastructure: Access to the internet and digital devices can be limited in some parts of India. This digital divide affects students' ability to access and benefit from online OERs.
- Institutional Resistance: Some institutions may be resistant to adopting OERs due to concerns about their quality, traditional teaching methods, or proprietary interests in textbooks and materials.
- Digital Literacy: Learners and educators need to have basic digital literacy skills to effectively use OERs. A lack of digital literacy can hinder the adoption and use of these resources.
- Technical Compatibility: Ensuring that OERs are compatible with different learning management systems and technologies used in Indian higher education can be challenging.
- Fragmentation: There is a lack of centralized repositories or platforms for OERs in India. This fragmentation can make it difficult for educators to discover and access relevant materials.

Exploring the Opportunities and Challenges of Incorporating Open Educational Resources in India

[Mahendraprabu et al, 2022] discuss the Prospects and Pitfalls of incorporating OERs in India: The last few decades have seen a remarkable expansion in digital technologies, which has facilitated the digital acquisition, storage, and dissemination of knowledge.

The paper suggests that HEIs in India, as well as other businesses and government agencies, are gradually adopting OER policies and practices to make the most of openly accessible resources online. Few educators, both in and out of the classroom, are familiar with the concept of open education or the benefits that OER may provide. Therefore, it is critical to develop and implement strategies to increase OER awareness and understanding in India.

They warn that the adoption of OERs into the Indian educational system needs a legal basis, which might be provided by proper open-license rules. The lack of regulatory guidance on its usage and repurposing in India is now impeding OER operations in the country. In the modern era, India has adopted a variety of steps to foster the development and improvement of OERs in the country. The Indian National Knowledge Commission recognizes the potential of OERs to widen participation in and success in formal education.

OER and Accessibility: Working Toward Inclusive Learning

[Thomas, 2018] discusses specific OER resources and programmes, including the Digital Library of India, the National Digital Library of India, Shod Ganga, Vidyanidhi, Ekalavya, etc. OER, educators have access to resources created by many people, including those who identify as disabled. By doing so, they have the potential to normalize and reduce stigma while giving a voice to perspectives that have been silenced in the past.

Unlike commercially published resources, OERs that have been adapted to fit accessibility criteria, can be preserved and freely shared among communities, which helps to reduce unnecessary repetition of work inside and between institutions. Although the cost-saving potential of OER adoption is appreciated by all students, it may be especially helpful for students with disabilities who may be experiencing financial hardships.

These programmes should be accessible for all children, including those with special needs and members of underrepresented groups, who should have access to quality education in the same classrooms and schools. The goal of this project is to catalogue what may be found on the web concerning education and to examine the linguistic, content, structural, and other technical aspects of Open Educational Resources.

According to Thomas, the utilization of Open Educational Resources in education disciplines has brought about significant positive changes, enhancing access, reducing costs, fostering customization, and promoting global collaboration. However, to fully realize their potential, continued efforts are needed to address quality assurance, digital accessibility, and awareness challenges. As education disciplines evolve, OERs stand as a powerful tool for advancing the field and ensuring that quality education remains accessible to all.

Guidelines on the development of open educational resources policies

[UNESCO, 2019] discusses Guidelines on development of OER Policies and frames them within the context of achieving the Sustainable Development Goals (SDGs) connected to education. Seeing the possibilities of OERs is the first step in crafting a policy to support them.

Othe use of OERs creates a virtuous cycle in which materials are generated, improved, and repurposed over time and in a variety of contexts, making high-quality learning resources more accessible to more people.

A policy is the result of a well-thought-out plan to accomplish a set of goals by assigning

certain practitioner actions more weight than others. The paper then moves on to discuss some potential ways in which OERs could be used to improve pedagogical practices. Taken together, these considerations inform the OER policy's overarching policy vision. The policymaker can construct a future vision for OER implementation by first establishing the value of OERs in the context of the current setting.

Accessible Open Educational Resources

[UNESCO, 2022] created a briefing paper on Accessible OERs. Some OER content may be accessible to people with disabilities and open to a variety of perspectives, but many problems still need to be overcome before the OER can be used by everyone who could benefit from it.

The accessibility of OER platforms, tools, and gadgets depends on their availability to as many people as feasible in as many communities and situations as possible. Ideally, OERs would be both easily accessible and open to revision and redistribution, creating a virtuous cycle in which both quality and availability are continually enhanced.

Accessible, means utilizing alternate/supplementary content (graphics, pictures), and utilizing straightforward language to explain the context. Content must be perceivable in order for the brain to process it; this includes being visible, audible, and tactile. Though they pertain primarily to online access, these ideas are general enough to be used to the creation of any open educational resource (OER). The principles aid in cultivating an appropriate inclusive mindset necessary to produce accessible content.

Guidelines for OERs in Higher Education

[UNESCO, 2011] discusses Guidelines for OER in Higer Education. As we know, OERs are instructional materials that educators are at no cost to access, reuse, adapt, and distribute.

These guidelines and also background information on the main issues surrounding the use of OER in HE are provided in the document. Their mission is to urge policymakers in HEIs and governments to invest in the systematic production, adaptation, and use of OERs and to mainstream these practices in order to improve the quality of curriculum and instruction while reducing associated costs. The use of OER is important to this process. They make it easier for authors to be recognized for their work while also allowing for its reuse in different contexts and adaptation to different educational systems.

The optimal use of OERs depends on ensuring that the concepts and methods for quality certification and recognition are in place. It is important to evaluate the effectiveness of OER integration into HEI practice and to determine OERs role in improving teaching and learning.

Open Educational Resources: Policy, Costs and Transformation

[UNESCO, 2016] discusses OER Resources, Policy, and Costs, and suggests Transformation can help students succeed in the ever-changing workplaces of the 21st century's information economy.

By keeping course materials up-to-date, relevant, and accessible to their intended audiences, OER can help bring about positive change in the education sector. In addition, OER can encourage the production, dissemination, and assembly of high-quality reusable resources at low cost, all of which can contribute to greater educational accessibility. Policies can be implemented for a variety of reasons, including administrative, economic, political, and others.

In many cases, OER policies are those that push for more OER production, use, and adaptation. The topic of this paper is the economical support of OER. The potential cost savings from using OER is often cited as a major benefit. Several chapters in the book try to fill this informational void and show how OERs can help cut down on government spending.

Open Educational Resources the Way Forward Deliberations of an International Community of Interest

The purpose of this paper [D'Antoni ,2014] is to create discussions on free and available course materials by a global interest group on the future. In 2005, the UNESCO International Institute for Educational Planning (IIEP) began working to address the widespread problem of educators' insufficient familiarity with OER. Without easily available and sufficient data, no alternative can be seriously considered for planning or reviewed and evaluated for its potential utility to any of the education stakeholders.

UNESCO's OER programs set out to educate Member States on the value of sharing educational materials online. The importance of this kind of worldwide arena for dialogue and information exchange is demonstrated by the perseverance of the OER community and the dedication of its participants. The establishment and maintenance of such a community are in line with UNESCO's basic goals. If the OERs movement is to succeed, the materials must be of a high quality and be seen as such.

Accessing information from websites across the globe can leave the user unprepared to evaluate the quality of the obtained data. The OER movement could benefit from a review of the state of education around the world.

References:

Zhang, Xiangling & Tlili, Ahmed & Nascimbeni, Fabio & Burgos, Daniel & Huang, Ronghuai & Chang, Ting-Wen & Jemni, Mohamed & Khribi, Mohamed Koutheair. (2020). Accessibility within open educational resources and practices for disabled learners: a systematic literature review. Smart Learning Environments. 7. 10.1186/s40561-019-0113-2.

[Balouva, 2020], Open educational resources: Issues and challenges, IJRAR- International Journal of Research and Analytical Reviews, 180-185. https://ijrar.org/papers/IJRAR1AZP036.pdf

Panda, S & Chakravarty, R. (2022). Web Content Accessibility Guidelines 2.1 Compliance by Indian OERs: An Empirical Study of Swayam and E-PG Pathshala. 58. 39-57. 10.5281/zenodo.7262854.

[Department of school education & literacy of India], Guidelines for Development of eContent for School & Teacher Education, 1-44, https://ncert.nic.in/pdf/GuidelinesforeContent3.pdf

[Commonwealth of Learning], OER for Skills Development, 1-4, 2023. https://www.col.org/projects/oer-skills-development/

[Open Educational Resources], On Open Educational Resources (OER) for use in computer-based learning and developing e –learning programs, Policy No:06, 1-4, Aug 2019. https://www.open.edu/openlearn/mod/oucontent/view.php?id=135544&section=2

[Central Square Foundation], Open Educational Resources for K-12 Education in India Central Square Foundation Concept Paper, 1-20, Aug 2013. https://www.education.gov.in/sites/upload_files/mhrd/files/upload_document/20130808_CSF ConceptPaper_OER_MHRDConference_v0.7.pdf

[Anastasi, K] Open Oregon Educational Resources, Improving the Digital Accessibility of OER: A Reflective Guide, Hofera, 1-14, Jun 2020. https://openoregon.org/digital-accessibility-guide/

[Thomas, R] Use of Open Educational Resources: Indian Scenario. , 6(5), 2017, pp. 17 International Journal of Library & Information Science26. http://iaeme.com/Home/issue/IJLIS?Volume=6&Issue=5

[Milijana, SK,], OER Higher Education Institutions in the Field of Library and Information Science during COVID-19 Pandemic, 1-26, Jul 2023. https://www.mdpi.com/2304-6775/11/3/38

[Hylén, J], OER: Opportunities and Challenges, 1-10, Jan 2006 https://www.oecd.org/education/ceri/37351085.pdf

[Bhattacharyya, S, 2022] A study on Open Educational Resources in education discipline from Indian online learning repositories, the online Journal of Distance Education and e-learning, vol 10, 19-34, 2022. https://www.tojsat.net/journals/tojdel/articles/v10i01/v10i01-03.pdf

[Pankaj & Basak, 2013] Pankaj Khanna and P C Basak, An OER Architecture Framework, Needs and Design, Athabasca University Press (AU Press), vol 14, 1-20, March 2013. https://www.researchgate.net/publication/289169679_An_OER_Architecture_Framework_Needs_and_Design

[Das, AK, 2011] Emergence of open educational resources (OER) in India and its impact on lifelong learning, 1-7, July 2011 https://www.researchgate.net/publication/238599328_Emergence_of_open_educational_resources_OER_in_India_and_its_impact_on_lifelong_learning.

[Dutta, 2016], Indrajeet Dutta, Open Educational Resources (OER) challenges and Opportunities for Indian Higher Education, Turkish Online Journal of Distance Education-TOJDE, vol 17(2), 1-12, April 2016. https://eric.ed.gov/?id=EJ1097245

[Kumar, 2009] M.S. Vijay Kumar, Open Educational Resources in India's national development, Open Learning: The Journal of Open, Distance and e-Learning, 24:1, 77-84, 2009. DOI: 10.1080/02680510802627860, 1-9, Feb 2009. https://www.researchgate.net/publication/240537878_Open_Educational_Resources_in_India's_national_development

[Padhi, 2018] Nayantara Padhi, Acceptance and Usability of OER in Indian Higher Education: An Investigation Using UTAT Model, 1-11, Jan-Mar-2018. https://files.eric.ed.gov/fulltext/EJ1171142.pdf

[Datt & Singh, 2021] Gopal Datt, Gagan Singh, Acceptance and Barriers of OER in Indian Higher Education, 1-15, vol 47(3), 2021. https://files.eric.ed.gov/fulltext/EJ1336581.pdf

[Zhang et al, 2020] Xiang ling Zhang, Ahmed Tlili, Fabio Nascimbeni, Daniel Burgos, Ronghuai Huang, Ting-Wen Chang, Mohamed Jemni and Mohamed Koutheair Khrib, Accessibility within OER and Practices for Disabled learners: a systematic literature review, 1-19, 2020. https://slejournal.springeropen.com/articles/10.1186/s40561-019-0113-2

[Perifanou & Economides, 2022] Perifanou M, Economides AA. Analyzing repositories of OER using web analytics and accessibility tools. Univers Access Inf Soc. 2022 Aug 7:1-15. doi: 10.1007/s10209-022-00907-6. Epub ahead of print. PMID: 35966186; PMCID: PMC9358107.

[Bansal, 2022] Tulika Bansal, Asian Journal of Distance Education, Current initiatives and challenges to OERs in Indian higher education, 1-9, 2022. https://www.academia.edu/8567503/Current_initiatives_and_challenges_to_OERs_in_Indian_higher_education

[Mahendraprabu et al, 2022], Dr.M.Mahendraprabu, K.Sathish Kumar, Dr.Edy Susanto, Dr. Irwan Fathurrochman: Exploring the Opportunities and Challenges of Incorporating Open Educational Resources in India, 1-22, 2022. http://repository.iaincurup.ac.id/1271/2/Exploring-the-Opportunities-and-Challenges-of-Incorporating-Open-Educational-Resources-in-India_compressed.pdf

[Thomas, 2018], Camille Thomas, OER and Accessibility: Working Toward Inclusive Learning, Journal SPARC, 1-3, 2018. https://sparcopen.org/news/2018/oer-accessibility-working-toward-inclusive-learning/

[UNESCO, 2019], UNESCO, Published by United Nations Educational, Scientific, and Cultural Organization, Guidelines on the development of open educational resources policies, 1-118, 2019. https://unesdoc.unesco.org/ark:/48223/pf0000371129

[UNESCO, 2022], UNESCO, Published by United Nations Educational, Scientific, and Cultural Organization, Accessible OER, 1-13, 2022. https://unesdoc.unesco.org/ark:/48223/pf0000380471

[UNESCO, 2011], UNESCO, Published by United Nations Educational, Scientific, and Cultural Organization, Guidelines for OER in Higher Education, 1-27, 2011. https://unesdoc.unesco.org/ark:/48223/pf0000213605

[UNESCO, 2016], UNESCO, Published by United Nations Educational, Scientific, and Cultural Organization, OER: Policy, Costs and Transformation, UNESCO and Commonwealth of Learning, 1-242, 2016. https://unesdoc.unesco.org/ark:/48223/pf0000244365

[D'Antoni ,2014], Susan D'Antoni, UNESCO. "Open Educational Resources: The Way Forward: Deliberations of an International Community of Interest." (2008).