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epaa@alperin.ca

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**Meeting the Challenges of Higher Education in India
Through Open Educational Resources:
Policies, Practices, and Implications**

Archana Thakran

Amity University



Ramesh C. Sharma

Indira Gandhi National Open University
India

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Abstract: Over the past two decades, the education sector in India has undergone a substantial transformation. Recent advances in technology have provided access to high quality educational resources and information on the Internet. This article examines the role of open educational resources (OER) in addressing the challenges of higher education in India, which range from geographical disparities in access to education, to shortages of trained and qualified faculty. The authors examine and discuss several OER initiatives that are currently advancing India's efforts to create strong institutional mechanisms to overcome the country's educational challenges through a national strategic framework designed to improve access to quality higher education. The authors

explore these initiatives designed to increase access to education through OER, as well as those designed to develop OER-related skills for educators. The article concludes with a discussion of the implications of these initiatives for the development of open educational practices in India.

Keywords: Open Education Resources; India; higher education; public policy; gross enrollment ratio; Twelfth Five Year Plan; equal educational opportunity; instructional materials and practices

Enfrentando los retos de la educación superior a través de los Recursos Educativos Abiertos en India: Políticas, prácticas e implicaciones

Resumen: En las dos últimas décadas el sector educativo en la India ha sufrido una gran transformación. Los avances recientes en la tecnología han facilitado el acceso a recursos educativos abiertos de alta calidad e información en Internet. El artículo analiza el rol de los recursos educativos abiertos (REA) para resolver los desafíos de la educación superior en India, que incluye desde las disparidades geográficas en el acceso a la educación a la escasez de docentes formados y cualificados. Los autores examinan y discuten varias iniciativas de REA que están realizando esfuerzos en la India con el fin de crear fuertes mecanismos institucionales para superar los desafíos educativos del país a través de un marco estratégico nacional diseñado para mejorar el acceso a la educación superior de alta calidad. Los autores examinan estas iniciativas diseñadas para aumentar el acceso a la educación a través de REA, así como aquellas dirigidas a desarrollar habilidades relacionadas con los REA para los educadores. El artículo concluye con una discusión de las implicaciones de estas iniciativas para el desarrollo de las prácticas educativas abiertas en la India.

Palabras clave: Recursos Educativos Abiertos; India; educación superior; política; tasa bruta de matriculación; Twelfth Five Year Plan; igualdad de oportunidades educativas; materiales de instrucción y practicas

Enfrentando os desafios da educação superior na Índia através do Recursos Educacionais Abertos: Políticas, práticas e implicações

Resumo: Nas duas últimas décadas, o sector da educação na Índia sofreu uma grande transformação. Os recentes avanços na tecnologia têm facilitado o acesso a recursos educacionais abertos e informação de alta qualidade na Internet. O artigo analisa o papel dos recursos educacionais abertos (REA) para resolver os desafios da educação superior na Índia, incluindo das disparidades geográficas no acesso a educação até a falta de professores treinados e qualificados. Os autores examinam e discutem várias iniciativas de REA na Índia que neste momento estão avançando seus esforços com o propósito de criar fortes mecanismos institucionais para superar os desafios educacionais do país a través de um enquadramento estratégico nacional desenhado para melhorar o acesso a educação superior de qualidade. Os autores examinam estas iniciativas destinadas para aumentar o acesso a educação a través dos REA, assim como aquelas destinadas a desenvolver competências relacionadas com os REA para os educadores. O artigo termina com uma discussão das implicações destas iniciativas para o desenvolvimento das práticas educacionais abertas na Índia.

Palavras chave: Recursos Educacionais Abertos; Índia; educação superior; política; gross enrollment ratio; Twelfth Five Year Plan; igualdade de oportunidades educacionais; materiais de ensino y practicas

Introduction

Access to quality education has been a cause for major concern for successive Indian governments. In 2007, legislation was enacted to promote universal education, namely the Right To Education Act, which lays out a comprehensive vision for raising the education profile of Indian

children (GIPC, 2007). While the right to education exists officially, India continues to face challenges to actualizing its goal of equitable access to quality education. These challenges include geographical and demographic barriers that inhibit access to educational institutions (GIPC, 2013; Lall, 2005), and a shortage of qualified educators (CARRHE, 2009). Such barriers are escalated by outdated facilities, overcrowded classrooms, outmoded teaching methods, and declining research standards (CARRHE, 2009; Kanwar, Balasubramanian, & Umar, 2010; Lall, 2005; Stella, 2002).

The growth of India's population indicates that access to education will continue to be a major concern. Currently, over 500 million Indians are age 5 to 25 years old. There are nearly 14.6 million students enrolled in 31,000 institutions, and currently there are about 700 universities. With the largest K-12 population globally, India will have the largest population in the higher education age bracket by 2030 (World Bank, 2012). It is expected that the number of eligible students will double by 2020, indicating an enormous gap between demand for higher education and its supply.

In this context, the National Knowledge Commission (NKC), which is charged with proposing education policy to the Indian government, recommended in 2007 that the role of OER be elevated as a means for supporting access to quality education for all, for example, through the establishment of faculty professional development programs on OER creation and use (NKC, 2009). The NKC recommendation furthers the Indian government's Right to Education (RTE) vision for promoting universal education, which aligns with the strategic framework for educational policy articulated in the national economic program known as the Twelfth Five Year Plan. Central to this strategic framework are the Three E's of higher education: Expansion, Equity, and Excellence (GIPC, 2013). The present article explores the progress achieved to date by some of the OER initiatives that are involved in achieving the Three E's in Indian higher education. The article concludes with a discussion of the implications of these initiatives for the development of open educational practices in India.

OER Initiatives to Meet the Challenges of Education in India

Pursuant to the NKC recommendations on OER for India's institutions of higher education, multiple projects to support OER access, creation and use have been initiated across the country. These initiatives, discussed below, have served to advance India's efforts to create strong institutional mechanisms to overcome the country's educational challenges. Unless otherwise noted, the discussion draws upon a literature review and first-hand information obtained by the present authors through direct association with the projects. The authors examine and discuss several OER initiatives

Initiatives to Increase Educational Access through OER

At the national level, several initiatives aim to advance India's strategic framework for Expansion, Equity, and Excellence in higher education, by increasing the availability of quality educational content via OER. For example, the National Council for Educational Research and Training (NCERT) provides free online textbooks to support the National Curriculum Framework that NCERT helped to develop in 2005. Similarly, teachers and learners have free access to supplementary curriculum-based content provided by the National Science Digital Library, due to an initiative of the Council for Scientific and Industrial Research.

OER content to supplement classroom teaching at the undergraduate college level is made publically available by the Consortium for Educational Communication (CEC), an inter-university center of the University Grants Commission. The CEC produces English language educational video programs in disciplines ranging from literature to medical science, based on prescribed syllabi.

Archived in a learning object repository, the programs are freely available for viewing on a Higher Education Satellite Channel called Vyas channel. Vyas was established in 2004 with the mission of bridging the knowledge and information gap by bringing higher education content to a large number of viewers across millions of households and classrooms nationwide. Plans to release materials in India's 22 different local languages are in progress.

Free, open, online engineering courses are also available, as part of a joint project by the National Programme on Technology Enhanced Learning (NPTEL), the Indian Institutes of Technology, and the Indian Institute of Science. Funded by the Ministry of Human Resources and Development and the Government of India, faculty created over 200 video recordings of English language lectures in engineering to improve the quality of technical education in India (Harishankar, 2012; NPTEL, 2012).

The NPTEL program operates under the auspices of the National Mission of Education, which stipulates the use of information and communications technology to support fair use of all content produced and to promote its reusability. To this end, NPTEL content is licensed through Creative Commons terms (CC-BY-SA), requiring attribution and allowing for copy and redistribution as well as adaptive transformation, provided that all adaptations are issued under the same license as the original (NPTEL, 2007). Originally intended as a sequence of stand-alone lectures to be broadcast nationwide, the NPTEL engineering lectures are currently being edited into smaller units with keyword indexing, to allow them to be more readily re-purposed across a variety of contexts (Harishankar, 2012). For instance, faculty in regional engineering colleges may formulate new lectures around portions of the NPTEL lectures (Harishankar, 2012).

In a related initiative, consolidating a shift away from discrete lectures toward entire, cohesive courses, IIT-Bombay launched three massive open online courses (MOOCs) in 2014 (Pushkar, 2014). These lecture-based courses, Introduction to Computer Programming, Part 1 and 2, and Thermodynamics, are slated for national accreditation. Enrolment in MOOCs is considered a method for increasing access to higher education as reflected in the Gross Enrolment Ratio, which currently stands at less than 20% for India—as compared to the global average of 27% (Pushkar, 2014). MOOCs also represent a broadband alternative to investing in physical infrastructure in remote areas (Pushkar, 2014).

Through the aforementioned initiatives, quality educational resources and courses have become increasingly available to students throughout India. These initiatives harness technology toward improving the quality of higher education available nationwide. They also contribute to national goals for expansion of education through widespread use of distance learning, thereby helping to address the shortage of trained and qualified faculty in India (GIPC, 2013).

Additionally, at a national level, educators throughout India are coming together to share resources and collaborate via the India chapter of WikiEducator. Established in 2008, WikiEducator-India began with the aim of making educational materials freely available toward the realization of a completely free version of the national education curriculum by 2015. Many universities, such as University of Mumbai, Acharya Narendradev College, Delhi University, Teerthanker Mahaveer University (TMU), are currently using and sharing content on WikiEducator.

WikiEducator has helped to build national OER capacity and has helped to foster the development of an “open” ethic in higher education, increasing knowledge sharing and collaboration—with more than 21,000 articles currently available for free on the site. Many educators have created courses and shared them with others.

Initiatives to Develop OER Skills

Recent initiatives to develop OER skills for educators, administrators, and subject matter experts have begun to address national goals for education expansion as well as challenges related to geographically disparate school distribution and rapidly growing populations. Several of these initiatives are discussed below.

Post Graduate Diploma in e-Learning (PGDEL). Founded in 1985, with the goal of providing higher education opportunities particularly to the disadvantaged segments of society, Indira Gandhi National Open University (IGNOU) is the largest open university in the world. IGNOU has long been involved in encouraging, coordinating and setting standards for distance and open education in India (Mythili, 2014).

IGNOU's Post Graduate Diploma in e-Learning (PGDEL) was specially designed for online learning and conceptualized as an OER-based curriculum (Mythili, 2014). Offered through IGNOU's Staff Training and Research Institute of Distance Education (STRIDE), the year long program involves five practical and theoretical courses designed to build skills necessary to learners seeking to become online educators or administrators of e-Learning (Mythili, 2014).

The initial phase of the PGDEL program, 2010-2012, focused on using existing OER to develop new educational content. During that phase, only 50 students were enrolled, due to a limited number of licenses available for a proprietary video conference included in the program (Mythili, 2014). According to a case study on the program by Mythili (2014), learners initially struggled with using static PDF materials, having expected more interactive multimedia materials. Additionally, the case study revealed a need on behalf of learners and course teams for better guidelines and quality assurance metadata to help them in identifying appropriate learning materials. Overall, the program was found to be successful in reducing the training time involved in professional development, with concomitant cost reduction attributed to the use of OER (Ibid). Graduates of PGDEL are qualified to work toward meeting national goals for education expansion through distance learning programs (GIPC, 2013), which will help to address the challenges of geographically disparate school distribution and rapidly growing populations (World Bank, 2012).

Teacher Education through School-based Support in India (TESS-India). The TESS-India project was initiated in November 2012 by The Open University in the UK and is funded by the Department for Funding International Development (DFID). The project focuses on providing professional development for educators in Indian states where education is in very poor condition—including Bihar, Madhya Pradesh, Uttar Pradesh, Odisha, Karnataka, Assam and West Bengal—with the goal of improving the quality and quantity of teacher education in India (TESS-India, 2012).

The project produces high-quality teacher development units (TDUs) and leadership development units (LDUs) designed to support teachers and school leaders in improving learning in their classrooms and schools. These units are made available online as OER, having been first localized for use according to state-specific terms, which tailor the units linguistically and culturally. To address infrastructural and technical challenges, the units are also made available through the alternative lower-tech medium of small “flash memory” cards, which retain data in the absence of a power supply.

TESS-India embeds OER throughout its teacher education programs, so that educators develop firsthand experience with learning through OER and acquire familiarity with web-based resources and online possibilities for knowledge sharing. The program also conducts regular workshops to support educators in adopting student-centered active learning pedagogies based on OER.

As a teacher education program, TESS-India contributes to India's national Three E's framework agenda by expanding access to professional training and support in isolated rural areas of

India (GIPC, 2013), and by providing educators with high quality localized OER as well as the pedagogical skills and knowledge necessary to promote improved learning through the use of OER. In particular, TESS-India focuses on developing productive synergies by combining teaching with research, and encouraging learner-centric pedagogies that accord with national goals for achieving excellence in education (GIPC, 2013).

The National Institute for Entrepreneurship and Small Business Development. A premier organization of the India's Ministry of Skill Development and Entrepreneurship, the National Institute for Entrepreneurship and Small Business Development (NIESBUD) has introduced several OER-based skill development programs in partnership with a U.S.-based organization, Progia LLC (NIESBUD, n.d.).

The programs, initiated in 2014, included a hands-on workshop to train participants in the use of OER for creating online courses. This workshop targeted educators, trainers, subject matter experts and entrepreneurs. Offered for a fee, the one-day workshop included instruction in finding, adapting, and using OER, as well as an overview of OER licensing. Workshop participants prepared a sample course using OER, and practiced localizing text and video according to the identified level and learning needs of their students. To date, the program has conducted over nine such hands-on workshops, and more will be offered going forward (NIESBUD, 2014).

OER MOOC. LMP Education Trust with support from Commonwealth of Learning (COL) conducted the first ever MOOC on OER in India, titled "The OER MOOC" (Pant, *et al.*, 2014). Designed to equip participants with knowledge and skills for effective OER use, the program included workshops on OER adoption and modification, as well as OER creation and sharing. The four-week program allowed flexibility and personalization, including an optional additional two weeks to complete the course if needed. Participants entered with varying objectives, from how to support effective student learning through OER, to how to tailor OER within courses to meet the needs of lifelong learners. The MOOC facilitated the formation of discussion groups and forums centered upon common interests and pursuits, helping to cultivate networks of colleagues and partners nationwide.

Conclusion: Implications for Open Education Practices in India

The foregoing discussion highlights several significant OER initiatives that are part of a national strategic framework designed to improve access to quality higher education, and that are transforming the higher education sector in India. Through the use of OER, the major challenges of higher education have begun to be addressed. Various OER-based models for open education practices have begun to impact policy and planning, as stakeholders including educators, researchers, teachers, and students have realized the benefits of OER in terms of cost reduction, availability of content, and access to material. OER and open educational practices in general have given many organizations the opportunity to provide quality education to a large population. Through multiple approaches—both top-down and bottom-up—involving various institutional partnerships and professional networks around OER, India has begun to make progress toward addressing the challenges facing higher education, and also helped to ensure a national basis for a self sustaining OER movement that enlists and synchronizes the creative, synergetic energies of educators and policy makers toward the realization of the nationally voiced goals articulated in the strategic framework of Expansion, Equity, and Excellence.

Although there has been work resulting in the development of new OER content and teaching skills, and millions of learners have been reached nationwide, many educators and

policymakers in India remain unaware of OER and its potential for improving both teaching and learning. Policymakers in the education domain would benefit from being made aware of the advantages of OER in supporting enhanced, more equitable access to education. As noted by Harishankar (2012), an overarching code of sharing and collaboration is required to sustain successful OER implementation in higher education, which must be supported by institutional stakeholders at all levels to achieve maximum efficiency in the development and dissemination of quality educational resources. Increased awareness of and support for the integration of OER throughout the national education sector will enable India to further its national goal of providing quality higher education for all.

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About the Authors

Archana Thakran

Amity University

address.archanathakran@yahoo.co.in

Archana Thakran is an OER expert and bio-technologist by profession. She has trained teachers on the use and adoption of OER in various Indian Universities. She is very passionate about transforming the educational system through the use of OER.

Ramesh C. Sharma

Indira Gandhi National Open University

rc_sharma@yahoo.com

Dr. Ramesh Sharma is Regional Director of Indira Gandhi National Open University, India. His areas of expertise are open and distance learning and online learning.

About the Co-Guest Editors

Lisa A. Petrides

Institute for the Study of Knowledge Management in Education

lisa@iskme.org

Lisa Petrides, Ph.D. is CEO and founder of the Institute for the Study of Knowledge Management in Education (ISKME). A former professor in the Department of Organization and Leadership at Columbia University, Teachers College, her research and teaching interests include information science, decision-making, and issues of access and equity in education.

Petrides also leads OER Commons (www.oercommons.org), a digital public library of open educational resources, and a collaboration platform that supports and facilitates the creation, sharing, and modification of open educational resources. Petrides received her Ph.D. from Stanford University.

Cynthia M. Jimes

Institute for the Study of Knowledge Management in Education

cynthia@iskme.org

Cynthia Jimes, Ph.D., is Director of Research at the Institute for the Study of Knowledge Management in Education (ISKME), where she has led international projects over the past ten years focusing on the use and impact of open educational resources on teaching and learning. While living in Sweden and the Netherlands from 1995 to 2004, she worked in both the private and public sectors, holding positions in research consulting, teaching high school and college, and obtaining her Ph.D. in Information Science from Uppsala University in Sweden.

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