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

Acceptation et barrières des ressources éducatives libres dans le contexte de l'enseignement supérieur indien

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Abstract

The purpose of this study is to highlight the role and awareness of and barriers to Open Educational Resources (OERs) in Indian higher education, specifically in the State of Uttarakhand. This study further investigates the factors that hinder the progress of OER acceptance in the teaching and learning process of higher education and suggests ways to overcome these barriers. Acceptance and barriers of OERs in Indian higher education have been analyzed with the help of responses received from 204 participants (students) through questionnaire, who are either enrolled in ODL or the conventional system of education in the state of Uttarakhand (India). This study found that post-graduate programme learners are more aware of access to OERs and the majority of learners reported that training/workshops based on OERs are beneficial for them. Findings from this study will be helpful in understanding the obstacles and hindrances faced by the learners and respective institutions in the process of offering OERs. This study was conducted during the COVID-19 lockdown period.

Keywords: Open Educational Resources; OER; Barriers; Higher Education; Technology-enabled Education

Résumé

L'objectif de cette étude est de souligner le rôle et la prise de conscience de et des barrières aux Ressources Éducatives Libres (RELs) dans l'enseignement supérieur indien, spécifiquement dans l'État d'Uttarakhand. Cette étude examine également les facteurs qui entravent la progression de l'acceptation des RELs dans le processus d'enseignement et d'apprentissage de l'enseignement supérieur et suggère des moyens pour surmonter ces obstacles. L'acceptation et les barrières des ressources éducatives libres

dans l'enseignement supérieur indien ont été analysées par le biais d'un questionnaire à l'aide des réponses reçues de 204 répondants (étudiants) qui sont inscrits soit dans la formation ouverte et à distance (FOAD) ou conventionnelle dans l'État d'Uttarakhand (Inde). Cette étude a révélé que les étudiants des programmes de troisième cycle sont plus conscients de l'accès aux RELs et la majorité des étudiants ont déclaré que les formations/ateliers basés sur les RELs leur sont bénéfiques. Les résultats de cette étude seront utiles pour comprendre les obstacles et les entraves rencontrés par les étudiants et les établissements respectifs dans le processus d'offre de RELs. Cette étude a été menée pendant la période de confinement provoqué par la COVID-19.

Mots-clés : Ressources éducatives libres ; REL ; Obstacles ; Enseignement supérieur ; Éducation basée sur la technologie

Introduction

Open educational resources (OERs) are learning materials offered freely to anyone and can be adopted by educators, scholars, or both. According to UNESCO, OERs can be defined as:

> [T]eaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions (Commonwealth of Learning, 2015, p. 8).

In 2002, the concept of OERs was coined by UNESCO. After a successful 18-year journey, today's digital era OERs have become useful tools for teaching and learning, training, and research among scholars and educators (Padhi, 2018).

Open educational resources have potential to foster and spread knowledge among educators (Tur et al., 2016), and the sharing and reuse of educational material, either in digital or another form, can be beneficial in better shaping the educational world. Using OERs leverages information and communication technology (ICT) based education that allows for flexible learning in terms of being accessible to anyone, anywhere, and anytime simultaneously. Today, as Internet users are increasing, OERs can play an important role in engaging learners. The OER movement started early and gained momentum when, in 2001 the Massachusetts Institute of Technology (MIT) began offering free learning materials for use worldwide. Later, many educational institutions come forward to adopt and popularize OERs. A few advantages of using OERs include: a) no cost availability of educational material; b) quality learning material; c) reusability of learning material; and d) sharing of resources. Therefore, the government of India initiated several mission-mode projects for the support of OER and ICT enabled education in the country, such as NPTEL, SWAYAM, NROER, Digital Library Inflibnet, Swayam Prabha, eGyanKosh, and E-PG Pathshala.

Open educational resources are considered to widen access, reduce the costs, and improve the quality of education. Open educational resources can facilitate the teaching and learning process when face-to-face interaction is not possible between the teacher and learners and can play a significant role in

improving open and distance learning education in India, in terms of quality, accessibility, reachability, and competitiveness with traditional education. Some popular OER repositories across the globe include: a) OER Commons; b) Khan Academy; c) MIT BLOSSOMS and Open CourseWare; d) the Commonwealth of Learning Virtual Learning and Institutional Repository; e) Directory of OER; f) Virtual University of Pakistan; g) LabXchange; h) Lumen Courses; i) MERLOT; j) eCampus; k) Skills Commons; l) NPTEL; m) SWAYAM; n) NROER; and o) Saylor Academy. The rapid development and increasing use of OERs in higher educational institutions is a good sign of futuristic education (Mtebe & Raisamo, 2014).

Challenges and Barriers of OER in Indian Perspective

In developing countries like India, OERs have great potential for providing quality education for all aspirants, as well as bridging the country's deficit of good teachers. Adoption of OERs can be a strategy for reaching the unreached and overcoming the severe challenge of accessing quality education across the country. In the era of ICT, the role of OERs is more prominent for changing landscapes of education, better learning opportunities, faculty development, remote accessibility of educational resources, and empowering education. Now educators in India are focusing on the development and design of e-contents for teaching-learning purposes with open licenses. The OER movement in India aims to provide access to free and quality e-content for even the remotest corner of the country. Open educational resources open doors to new models of teaching-learning through blended and collaborative learning. Despite their worldwide popularity and proven usefulness, OER adoption still faces some significant challenges, especially from an Indian perspective, including infrastructural barriers, language barriers, technical knowledge barriers, and availability of Internet connectivity and speed.

COVID-19 and OER

The global COVID-19 pandemic has posed a very serious challenge to India and the world. In this time of crisis, educational institutions in many countries shifted to online learning as an alternative to in-person learning. With the massive and abrupt move to remote teaching and learning, higher education institutions need to have a system that can make online education free and accessible to everyone in the country. It is believed that if open and distance learning and online learning can have the same outcomes as campus education in India, without requiring teachers and learners to be in the same place at the same time, these approaches are well prepared and designed to meet the needs and requirements of the local aspirants.

Many international and national organizations like the Commonwealth of Learning are ready to share their expertise, knowledge, and resources to enable stakeholders to keep the doors of learning open for all. During the pandemic, it became necessary to explore novel ways to enable leaner-learner and learner-teacher interaction, and to use appropriate technologies, renewing a commitment to sharing and reusing OER so that no one is left behind. Educational institutions adopted alternate ways of teaching, including online learning and delivering learning using ICT tools such as radio, TV, and mobile devices, so that no learner is disadvantaged. Developing countries like India identify existing OERs to provide quality learning and encourage teachers in the educational institutions to use free resources in their online classes. By using these innovative approaches, a nation can open the doors of learning not just for

formal education but non-formal and informal learning that is accessible, affordable, and available to everyone (Commonwealth of Learning, 2020).

Indian Higher Education

The Indian higher education system constitutes of total 993 universities, 39,931 colleges, and 10,725 stand-alone institutions, including 14 state open universities, one central open university (Indira Gandhi National Open University), and one private state open university (Venkateshwara Open University, Arunachal Pradesh). There are 110 dual-mode universities that offer education through distance- as well as traditional-mode. The average college density of the Indian higher education system is 28[1]. The Gross Enrolment Ratio (GER) for higher education in India is 26.3%, which is calculated for the age group of 18-23 years. The nationwide GER for males and females is on par (26.2% and 26.4%, respectively). India's open and distance learning (ODL) education system accounts for 10.62% of the total 26.3% GER, for approximately 40% of total enrolments in higher education in India. Among female learners enrolled in higher education, 44.15% participate via ODL, which is a positive sign of empowerment. Pupil Teacher Ratio (PTR) in conventional (regular mode) education in universities and colleges is 29:1 (Ministry of Human Resource Development, 2019).

Higher Education in the State of Uttarakhand

Uttarakhand is a hilly state where multifaceted developmental issues and topographical barriers exist. Uttarakhand is ahead on the literacy front in comparison to the national average literacy rate (74.04% for national and 79.63% for the State of Uttarakhand), but employment and migration problems are of great concern (Tolia, n.d.). The state literacy rate is a good sign for developing educational infrastructure, so that the GER can be increased. For the upgradation of the skills and knowledge of the state learners, OER can play an important role in acquainting the learners with worldwide advancements relating to their areas of interest. State higher education needs to think, plan, and execute more effective and result-oriented policies with special reference to improving and reforming learners' participation in higher education.

Literature Review

Luo et. al. (2020) emphasized that to work toward ensuring the sustainability of OER within institutions, it is important that partnerships are established with key figures on campus, including instructional designers, e-learning staff, and academic librarians. Chakraborty and Ghosh (2011) analyzed the merits of open access resources in higher education in India, focussing especially on the developing country context. Chakraborty and Ghosh also highlighted the impact of the open archiving resources of premier higher learning and research institutes of India. Bansal et al. (2013) stressed that in the modern era of information technology, digital resources have become a readily accessible source of learning for teachers and learners. The authors also examined the OER movement in Indian higher

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[1] College density in known in terms of per one lakh eligible population (age-group 18-23 years). It shows that for one lakh eligible population 28 colleges are available in Indian higher education.

education. Jeelani et al. (2015) examined and emphasized the rapid advancement of the OER movement at the global level and suggested that there is an urgent need to make OERs easily accessible to disabled learners in developing countries. Henderson and Ostashewski (2018) concluded that the major benefit to OERs identified by educators is the continued collegial atmosphere of sharing and lifelong learning.

Dutta (2016) identified several challenges for OERs in Indian higher education, such as poor infrastructure, lack of quality educators, inadequate educational and technological tools, and poverty. Dutta also highlighted the efforts of the Government of India initiatives for National Mission on Education through Information and Communication Technology (NMEICT). Such efforts are landmarks to disseminate educational resources among aspirants. Kurelovic (2016) stressed the importance of raising awareness of OERs in small countries where the availability of OERs in the local or native language is uncommon and analyzed the attitudes of scholars towards OERs and the sharing of learning material. Thakran and Sharma (2016) explored the role of OER and the challenges faced by the use of OER in Indian higher education, examined the initiatives taken to increase the access to education through OER, and analyzed these initiatives for insights to inform the development of OER in an Indian higher education context. Singh and Panigrahi (2018) identified factors that influence the perspectives of and acceptance of open learning resources among higher education students in India, highlighting the relative advantages, compatibility, and facilitation of OERs. The study by Singh and Panigrahi has practical implications for higher education policy development.

Need and Scope

Open educational resources have led to an emergence of creative participation in the development of digital content across the higher education sector in India. Government and central and state universities have realized the importance of OERs for expanding the access to higher education. In a country with a large population, limited budgeted resources, and infrastructural problems, OERs may be a worthy tool offering specific features for easier geographic reach, accessibility, and delivery through the web. Available traditional resources (i.e., in-person teaching and learning) are inadequate to fulfill the demands of Indian higher education. This study aims to analyze and present usage of and barriers to OERs in Indian higher education using data collected from learners across Uttarakhand. Further, this study aims to analyze the impact of OERs in facilitating unrestricted access to quality higher education, to highlight the OER initiatives undertaken in the different parts of India, and gauge where Uttarakhand stands in the OER movement in higher education in comparison to its counterparts.

Objectives

The objective of this study was to:

- examine the usage of OERs in Uttarakhand higher education;

- identify the barriers to OERs in India; and

- recommend suggestions for overcoming the barriers that hinder the progress of OER.

Research Methodology

This is a descriptive research study that has been carried out to examine the acceptance of and barriers to OER in Indian higher education in the state of Uttarakhand. The data for this study was collected from primary and secondary sources. Considering the objectives of the study, primary data has been collected in the form of a questionnaire from the students enrolled in the open and distance learning institution and the conventional systems of education across the state of Uttarakhand. Various published reports of Distance Education Institutes, University Grants Commission, Distance Education Bureau, and the Ministry of Education (MoE, India) have been studied. Keeping in mind the nature of the study, the data collected from the respondents (students) has been analyzed with the help of mathematical and statistical tests wherever applicable.

Questionnaire

The questionnaire included 12 general demographic questions relating to: a) gender; b) age group; c) highest qualification; d) occupation; e) employment status; f) Internet facility at home or workplace; g) devices mostly used for accessing Internet; h) enrollment in an ODL or conventional system of education; i) district; j) Internet skills; and k) time spending for online learning. The questions were organized in two sections; Section 1 contained general questions whereas Section 2 contained questions relating to awareness of and barriers to OERs.

Participants

The questionnaire was sent to more than 250 students studying in higher education institutions across Uttarakhand via e-mail, instant messenger, or other social media. The survey questionnaire was available for completion for 25 days and a total of 204 responses were received. The random selection of survey participants was based on age group, qualification, occupation, employment status, and enrolment in ODL system of education and or conventional system of education.

Results and Discussion

This study was conducted during the COVID-19 lockdown to analyze the usage and barriers of OERs in the teaching and learning process in higher education in India, with specific focus on the state of Uttarakhand. In this study the acceptance of and barriers to OERs are analysed in the context of ensuring the quality of the teaching and learning process in higher education during a pandemic like COVID-19, as well as examining how to overcome the barriers that hinder the progress of OER.

Table 1

The Demographic Profile of the Participants

Category	Participant	n	%
Gender	Male	112	54.9
	Female	92	45.1
Qualification	Grade 10 or Equivalent	2	1.0
	Grade 12 or Equivalent	23	11.3
	Graduate or Equivalent	54	26.5
	Post-Graduation or Equivalent	82	40.2
	Ph.D	36	17.6
	Others	7	3.4
System of Education	Open and Distance Learning	97	47.5
	Conventional System of Education	107	52.5
Participation in Training/Workshop Related to OERs Awareness	Participated	96	47.1
	Did Not Participate	108	52.9

Table 2

Respondents by District[a] (n=204)

District	n	%
Almora	30	14.7
Bageshwar	2	1.0
Chamoli	1	0.5
Champawat	2	1.0
Dehradun	8	3.9
Haridwar	2	1.0
Nainital	74	36.3
Pauri Garhwal	3	1.5
Pithoragarh	7	3.4
Rudraprayag	0	0.0

District	n	%
Tehri Garhwal	1	0.5
Udham Singh Nagar	73	35.8
Uttarkashi	1	0.5

[a]Participants from other districts were not included due to limited accessibility and connection issues.

Table 3 describes the respondents' perceived level of benefit of receiving OER related training. Level of benefit was measured on a 5-point grade scale. Overall, 75% of respondents indicated that the training/workshop was either extremely beneficial or very beneficial, and 19.8% of respondents feel that the training was somewhat beneficial. The results indicate that the OER related trainings/workshops are beneficial in understanding the applications and how to use the resources.

Table 3

Respondents' Perceived Level of Benefit from OER Training/Workshop (n=96)

Level of Benefit	n	%
Extremely Beneficial	26	27.1
Very Beneficial	46	47.9
Somewhat Beneficial	19	19.8
Not so Beneficial	4	4.2
Not at all Beneficial	1	1.0

Table 4 described access rates for 17 top-rated OER repositories worldwide where the accessing rate of these repositories by the participants are recorded.

Table 4

OER Repository Access by Respondents Belonging to ODL vs Conventional System of Education

OER Repository	Enrolled in ODL n (%)	Enrolled in Conventional System of Education n (%)
NPTEL	41 (42.2)	34 (31.77)
SWAYAM	58 (59.8)	48 (44.85)
NROER	7 (7.21)	9 (8.41)
Saylor Academy	10 (10.3)	6 (5.6)
OER Commons	16 (16.5)	6 (5.6)

OER Repository	Enrolled in ODL n (%)	Enrolled in Conventional System of Education n (%)
Khan Academy	40 (41.23)	29 (27.1)
MIT BLOSSOMS	7 (7.21)	4 (3.73)
COL Virtual Learning	3 (3.09)	4 (3.73)
Directory of OER	9 (9.27)	5 (4.67)
COL's Institutional Repository	-	-
Virtual University of Pakistan	-	2 (1.86)
LabXchange	4 (4.12)	2 (1.86)
MIT Open CourseWare	13 (13.40)	5 (4.67)
Lumen Courses	2 (2.06)	2 (1.86)
MERLOT	5 (5.15)	2 (1.86)
eCampus	28 (28.8)	12 (11.21)
Skills Commons	28 (28.8)	27 (25.23)

Table 5 shows that respondents belonging to the ODL system of education are using more OERs than respondents belonging to the conventional system of education. In India, the leading initiatives by the Ministry of Education (Government of India) in the field of OER are SWAYAM and NPTEL. In case of SWAYAM, 60% and 45% respondents from the ODL and conventional system of education, respectively, reported accessing resources through this source. The NPTEL repository was second, accessed by 41% of respondents from ODL and 31% of respondents from the conventional system of education. For several OER repositories, the access rate was less than 10% for both respondent categories. There may be several barriers to access OER repositories, such as availability of course or material, language availability, and students' awareness of the repository. The other OER repositories should be made available to the learners to add benefit and reduce access barriers to OERs.

Table 5

Reported Barriers Faced While Accessing OERs by ODL vs Conventional System of Education Respondents

OERs Barrier	ODL Respondents n (%)	Conventional Respondents n (%)
Lack of Internet Access and Speed Issue	59 (60.82)	47 (43.92)
Lack of Familiarity with Online Technical Tools	33 (34.02)	33 (30.84)

OERs Barrier	ODL Respondents n (%)	Conventional Respondents n (%)
Lack of Awareness	24 (24.74)	40 (37.38)
Lack of Availability of Required Courses	21 (21.64)	31 (28.97)
Lack of ICT Skills	18 (18.55)	18 (16.82)
Lack of Motivation	17 (17.52)	22 (20.56)
Lack of Language Skills	12 (12.37)	26 (24.29)
Lack of Understanding of Instructions	12 (12.37)	16 (14.95)
Lack of Sufficient Prior Academic Knowledge	10 (10.30)	16 (14.95)
Lack of Willingness	9 (9.27)	18 (16.82)

Based on the barriers identified by the participants while accessing OERs, a framework/model was proposed to guide OER implementation (Figure 1). The proposed framework/model identifies a hierarchy of access barriers with three different levels. Based on the literature reviewed and other sources, the author(s) identified 10 key OER barriers that hinder the access to OER from the intended participants. To establish a global popularity and acceptance of OERs, there is an urgent need to resolve all such hierarchical barriers on a priority basis.

In context with the proposed framework/model of accessing barriers of OERs (Figure 1), recommendations to resolve barriers at each level are also proposed (Figure 2).

Figure 1
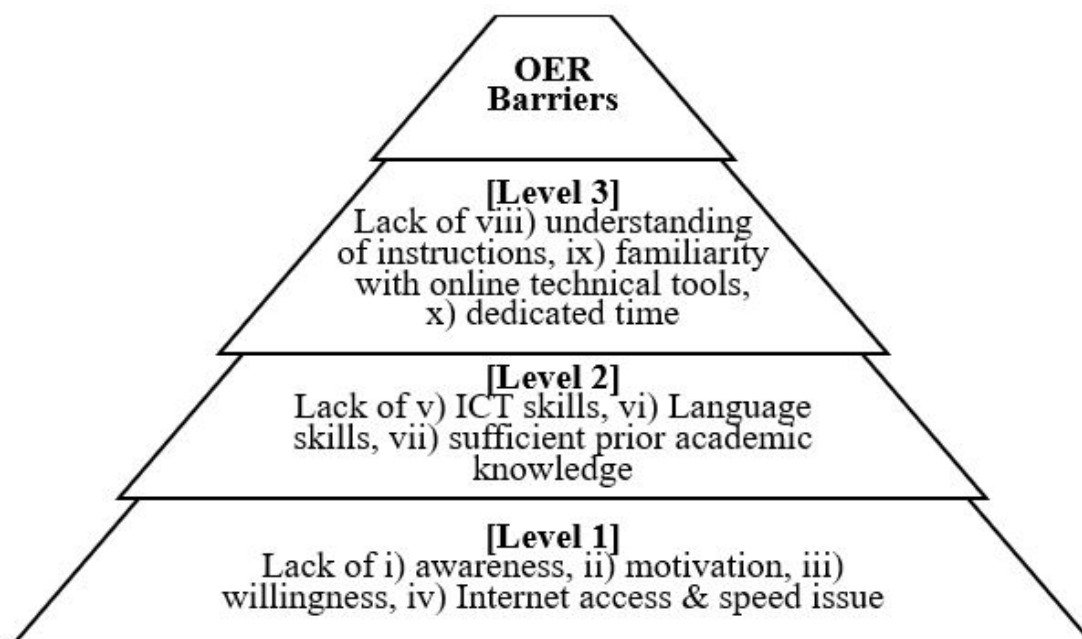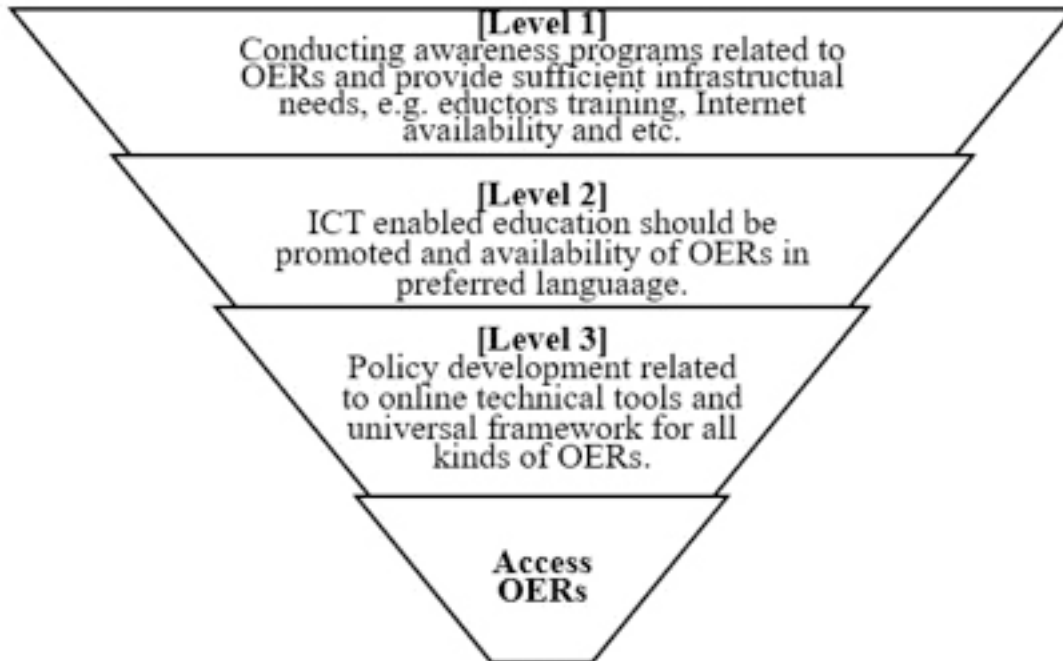
Proposed Framework/Model of OER Barriers

Figure 2

Proposed Framework/Model of OER Access

Proposed Framework/Model of OER Barriers/Access

In a state like Uttarakhand, Internet accessibility and speed is a great challenge. Uttarakhand is a hilly state with a total area of 53,483 km², which is mostly covered by the Himalayan peaks and glaciers. In such conditions the people from the remotest areas of the state are unable to access Internet services with good speed and without interruption. Therefore, the issues related with lack of Internet access (Figure 1, Level 1) and lack of familiarity with online technical tools (Figure 1, Level 3) must be resolved on a priority basis so that the maximum benefits of OER can also be availed by the participants residing in the remote and hilly areas of the state.

Conclusion and Recommendations

Open educational resources are becoming increasingly popular. There is no doubt that OERs play a vital role in disseminating knowledge over a wide spectrum. This makes OERs very useful for improving access and equity across the entire education sector. Basically, the OER concept is rooted in the belief that unrestricted access to education should be available to everybody, and OERs offer limitless potential to expand knowledge among lifelong learners around the world. The OERs hold the specific features of easy access to learning resources, facilitating the sharing of knowledge, rapid dissemination of information, expansion of the range of teaching and learning strategies and improving

educational quality at all levels. Besides these specific features, there are critical barriers that hinder the progress of OER including technical, economic, social, policy-oriented, and legal barriers. Infrastructural issues, such as lack of awareness, lack of ICT skills, lack of motivation, and technological backwardness, are the biggest challenges encountered by developing countries like India with respect to the use of OER. However, the barriers to OER use in Indian higher education can be overcome through the following measures initiated by government, university, and institutional leadership:

- Guide the matching OERs appropriately to the teaching-learning environment through new technology policies;

- Increase awareness among the teachers, researchers, and learners about the availability and benefits of OER in facilitating quality teaching-learning processes;

- Support the development of skills among teachers to use or share the resources developed by other teachers or institutions;

- Train teachers and learners for effective use of OER through capacity-building initiatives;

- Motivate educators for developing OER by introducing a reward system;

- Integrate OER into university curricula and organizational structures;

- Develop infrastructure to enable creating, federating, and finding the best OERs available worldwide; and

- Generate appropriate cyber and e-infrastructure across the country and educational institutions.

Open educational resources have emerged as a useful means for providing high quality education to the masses and have limitless potential to expand knowledge among lifelong learners around the world.

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