

Assessment of the Utilization of Open Educational Resources during and after the Pandemic

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ASSESSMENT OF THE UTILIZATION OF OPEN EDUCATIONAL RESOURCES DURING AND AFTER THE PANDEMIC

Abstract:

The COVID pandemic situation posed several unprecedented challenges to the teaching fraternity. Apart from the challenges, it also provided avenues to explore the use of open educational resources. The digital learning materials acted as supplementary learning materials and catered for the need of the students. As a faculty member, one of the duties is to streamline the collection of learning resources from authentic sources and promote an ethical way of adopting the same. Through the internet, learning materials are available at plenty and sold for prices.

The cost, students tend to avail the pirated or obtain from the sites in an unprofessional manner. It is highly imperative for teachers to promote open educational resources and infuse good learning practices. To promote OER, the faculty members need to be aware of the same. Hence sensitization workshop was conducted through online lectures (pre-recorded) and delivered to more than 7000 learners. To measure the learning outcome, a change project is provided to study their effective utilization of OER.

In this research paper, the observation was made from the questionnaire survey administered to 1633 faculty members about their awareness and adoption pattern of open educational resources. The study was carried out in two phases during the month of December in the years 2020 and 2021. Around 66.2% of male faculty members and 33.8% of female faculty members effectively answered the questions. Approximately 70.5% of the faculty members were aware of OER before the pandemic but never utilized it effectively, 19.5% of faculty members used it before the pandemic at a minimum level, and 10.5% never utilized the OER. It was decided to understand how often they used the OER platforms for teaching and learning before and after the pandemic.

How it evolved over the period. It is also checked to understand their needs to translate the available resources into the native language. The study has observed the level of faculty members (Professor 9.5%, Associate Professor 15.2%, Assistant Professor 60.3%, others 15%) along with their branch of specialization. The questionnaire also enquired about the type of content they fetched in the OER and their contribution to the OER.

The study outlined the importance of OER during and after the PANDEMIC and how the scope of adoption increased after the pandemic. It facilitated the adoption of the materials and also strengthened the OER repositories. The peer review and the validation of the material's authenticity are the need of the hour. The transformation in the ecosystem with sharing resources is quantified based on the study.

Introduction:

The educational ecosystem has transformed tremendously after the pandemic, and it gets augmented with the infusion of digital resources for teaching, learning and assessment [Al-Freih and Richter, 2021; Hilton et.al., 2021; Kimmons and Belikov 2021]. The three major tenets of digital education are (a) Learning Environment; (b) Instructional Materials; and (c) Assessment [Janardhanan and Sudhindra, 2019]. The success of digital education depends upon its implementation and it mainly depends on faculty exposure, knowledge and adoption of Information and Communication Technology (ICT) tools and techniques. Faculty members' perceptions of ICT tools and Open Educational Resources (OER) play a vital role

in their adoption of them. During the pandemic, OER was a great supplement to instructional materials and had a positive impact on student learning outcomes. OER were found to be effective since the library were unavailable due to lockdowns and other pandemic disruptions [Dhanarajan, G., and Abeywardena, I., 2020; Hilton et.al., 2020, Ikahihifo et.al., 2021].

Open Educational Resources (OER) refer to any instructional and learning materials that are available free for usage, including sharing and adoption, without any financial charges. The OER comes under Open Courseware (OCW), the free and open digital publication of educational and learning content [UNESCO, 2019]. The use of OER has become increasingly popular among educators and students worldwide due to their affordability, flexibility, and ability to cater to diverse learning styles. The main advantage to the faculty members is to adapt OER to the specific instructional requirements with freedom. The successful implementation of OER depends upon the following:

1. Awareness and access to the resources.
2. Quality of the OER material.
3. Exposure to the different methods of adopting the material in the course instruction.

The purpose of the study is to obtain the reason for the following research questions: (1) The awareness of the faculty members about the OER (National & International Level); (2) The OER adoption pattern before, during and after the pandemic; (3) Metrics to identify the quality of OER Material; and (d) The cadre of faculty who adopted the OER.

Open Educational Resources and Faculty Awareness

The Open Educational Resources (OER) movement in India has been gaining momentum in recent years, with various initiatives and programs launched by the government and educational institutions to promote the use of OER. The development of OER started with the National Mission on Education through Information, Communication and Technology (NMEICT) project. In 2017, the Ministry of Human Resource Development launched the National Digital Library of India (NDLI), which provides access to a wide range of educational resources including e-books, videos, articles, and thesis in various subjects. In 2019, the University Grants Commission (UGC) released a policy document titled "UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations, 2018", which encourages the use of OER and states that "the faculty should adopt open access materials like open textbooks, open educational resources, and reference materials". OER encompass textbooks, instructional materials, videos (Lecture, Laboratory demonstrations), Activity sheets, simulations, quizzes and other assessment tools. OER is mainly released under Creative Commons or a similar license that supports open or nearly open use of the content. Overall, the OER movement in India is gaining momentum, and with the support of the government and educational institutions, it has the potential to make a significant impact on improving access to quality education for all. There are many Open Educational Resources (OER) providers in India. Here are some of the popular ones are listed below:

- (a) Study Webs of Active-Learning for Young Aspiring Minds- SWAYAM (<http://www.swayam.gov.in>).
- (b) Sakshat: (<http://www.sakshat.ac.in>)
- (c) National Repository of Open Educational Resources (NROER) : (<http://nroer.in>)
- (d) National Council Of Educational Research & Training (NCERT): (<http://www.ncert.nic.in>)
- (e) National Program on Technology Enhanced Learning (NPTEL) (<http://nptel.ac.in>)
- (f) Teachers Repository in Engineering Education (TREE) (<https://nitttrc.ac.in/tree>)
- (g) National Institute of Open Schooling (NIOS) (www.nios.org)

(h) e-PG Pathsala: (<http://epgp.inflibnet.ac.in/>)

The following are the advantages of OERs:

1. Customization: One of the significant advantages of OER is that it can be customized to suit the specific needs of faculty members and their students. Faculty members can modify OER to include examples, exercises, or explanations, making the material more relevant and engaging for their students.
2. Supplementing textbooks: Many faculty members use OER to supplement the textbooks they use in their classes. They can provide students with additional reading material, videos, or other resources that further expand on the topics covered in the textbook.
3. Creating course content: Faculty members can use OER to create their course content, such as textbooks, lectures, or quizzes. Using OER, they can save time and resources that would otherwise be spent on writing materials from scratch.
4. Collaborative teaching: Faculty members can collaborate with other educators and share their OER to create joint teaching materials. This allows them to pool their expertise to develop high-quality educational resources that benefit their students and other educators.
5. Personal development: Faculty members can use OER for their personal and professional development. They can use them to learn new skills, explore new subjects, or keep up to date with the latest research and trends in their field.

Owing to its several advantages, it is important to empower the faculty members about the features of OER. Based on the literature review, several models are available for OER adoption, and customisation is needed based on the requirement of the institution. In the OER adoption framework (CoX & Trotter, 2017) (Figure 1), a six-layer structure with access as the base and volition at the top. To prepare the rollout plan for the sensitization and adoption of OER, it is mandatory to understand the existing situation/awareness among the faculty members.

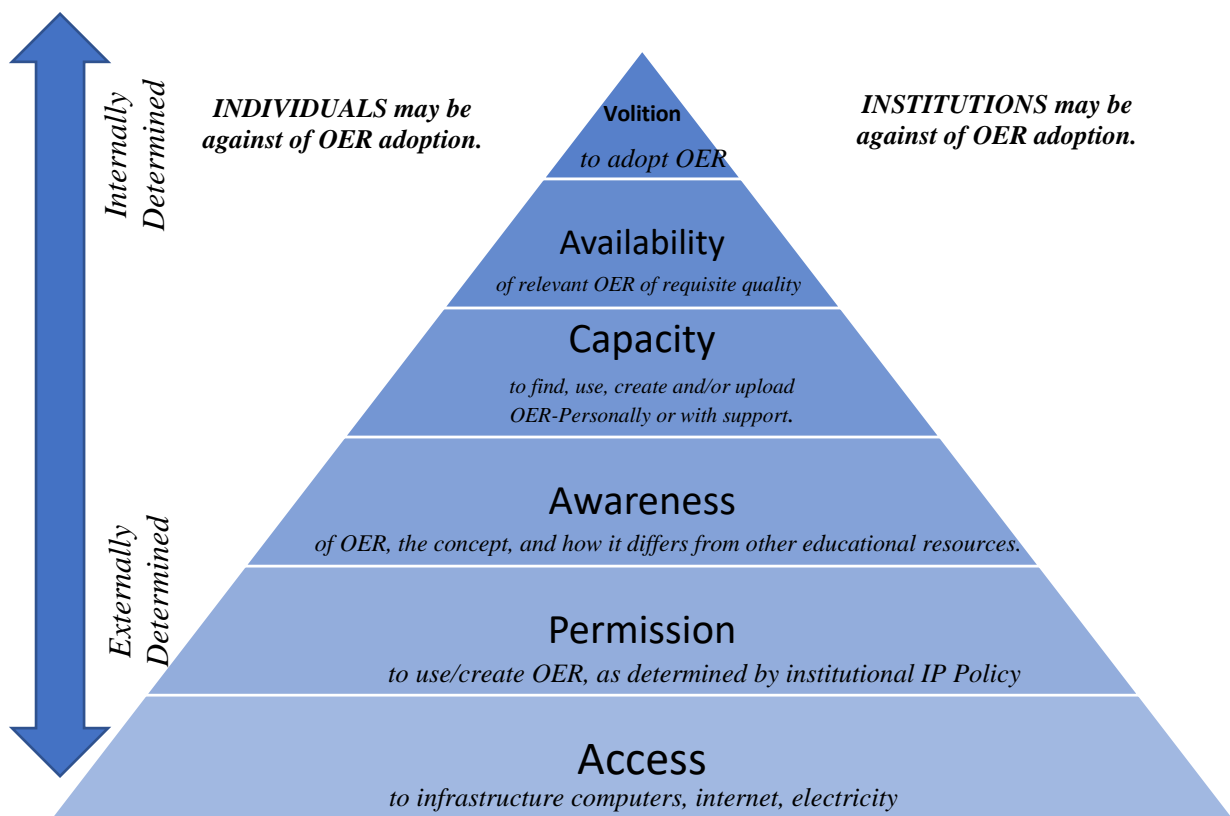


Figure 1: OER adoption pyramid

Note: Modified from "An OER framework, heuristic and lens: Tools for understanding lecturer's adoption of OER by G.Cox and H. Trotter, 2017, *Open Praxis*, 9(2). P.155.

Methodology:

The study is based on a questionnaire circulated to the faculty members, which aims at identifying and understanding factors influencing the current adoption of OER. It also focussed on understanding the usage pattern among circuit (Computer science (CS), Information Technology (IT), Electrical, Electronic communication engineering (EECE),) and non-circuit (Civil (CE), Mechanical (ME), Production (PE), Biotechnology(BT)) branch faculty members. The whole study methodology is depicted in Figure 2 and described below.

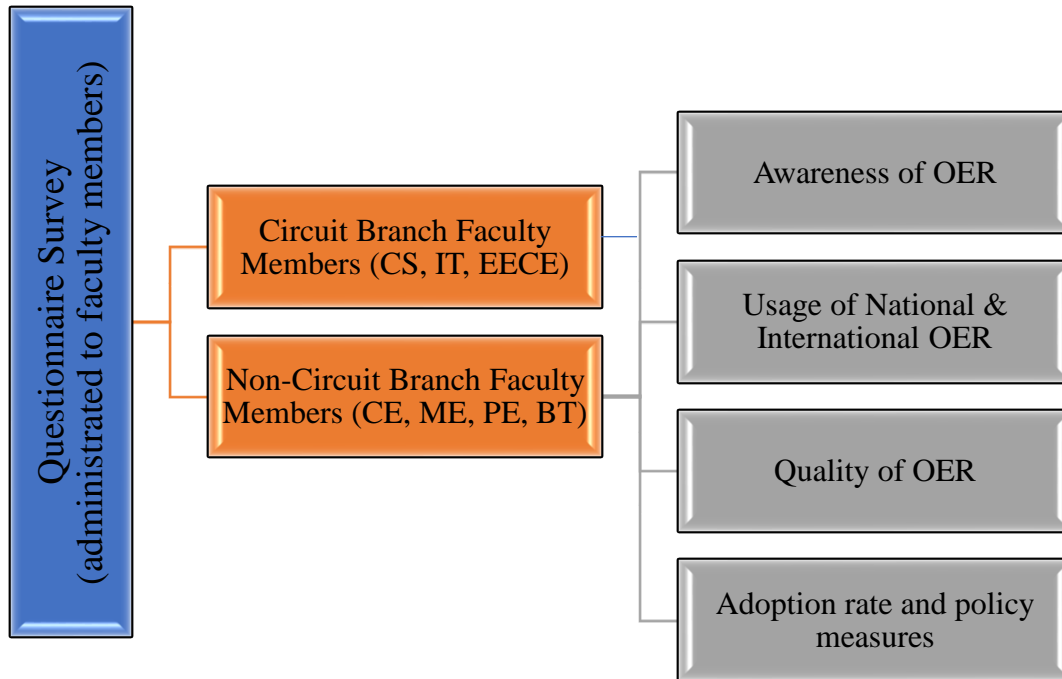


Figure 2: Study methodology

In the first phase, general details about the faculty members were collected. The questionnaire was clustered into four main parts (a) Awareness about the OER; (b) Usage of National & International OERs (C) Quality; and (d) Adoption policy, as tabulated in Table 1.

Table 1: Research questions in a defined cluster

AWARENESS ABOUT OER	USAGE OF NATIONAL & INT'L OER	QUALITY	ADOPTION POLICY
<ul style="list-style-type: none"> • Questions related to Gender, Cadre, Department (Specialization) • How do faculty members become aware of OER? • Whether undergone any training about OER? 	<ul style="list-style-type: none"> • Awareness of international OER • Adoption of National or International • Adoption in theory or practical course • Adoption in assignment or reading activities 	<ul style="list-style-type: none"> • How to ensure quality and rank OER? • What are the aspects and attributes define quality? • Whether recommended to other colleagues? 	<ul style="list-style-type: none"> • Availability of any institution development policy • Whether faculty members involved in policy making? • Any incentive provided by the institution for developing OER.

Before the pandemic the usage of OER was relatively low, however, after the pandemic, the usage depends upon the quality of OER. In 2020, 59% of faculty members in Indian higher education institutions reported using OER during the pandemic. The study also found that 58% of faculty members believed that OER would continue to be relevant in the post-pandemic world [Kumar et.al., 2021].

Identifying the quality of Open Educational Resources (OER) is crucial for faculty members to ensure that they are using reliable and effective resources in their teaching. The following items pave the way for faculty members to assess the quality of OER.

1. **Authority:** Faculty members should look for OER that are created by reputable organizations, experts in the field, or established educational institutions. The credentials of the author or creator of the OER should be easy to find and should demonstrate expertise in the subject area.
2. **Accuracy:** OER should be based on accurate and reliable information, supported by evidence and references. Faculty members should look for OER that are peer-reviewed or have undergone some form of quality assurance process. They should also verify that the OER reflects current knowledge and practices in the subject area.
3. **Relevance:** Faculty members should look for OER that are relevant to their courses and the needs of their students. OER should cover the topics and concepts that are required for the course and should be presented in a way that is accessible and engaging for students.
4. **Currency:** OER should be up-to-date, reflecting the latest research and developments in the subject area. Faculty members should look for OER that are regularly reviewed and updated to ensure that they remain relevant and accurate.
5. **Accessibility:** OER should be accessible to all students, regardless of their background, abilities, or disabilities. Faculty members should look for OER that are available in multiple formats and are designed with accessibility in mind.
6. **License:** Finally, faculty members should consider the license under which the OER is released. OER should be released under an open license that allows for free use, sharing, and adaptation. Faculty members should also check the terms of the license to ensure that they comply with any requirements or restrictions.

By considering factors such as authority, accuracy, relevance, currency, accessibility, and license, faculty members can make informed decisions about the OER they choose to use in their course.

The questionnaire adopted for the study to understand both the awareness and quality of Open educational resources by faculty members is as follows:

Section – A: Awareness about OER – General Information

1. Name of the faculty member: (Optional)
2. Gender: Male/Female / Third Gender
3. Designation: Lecturer / Assistant Professor / Associate Professor / Professor
4. Department:
5. Specialization:
6. Have you heard of Open Educational Resources (OER) before? a. Yes b. No
7. How would you define OER?
 - a. Educational resources that are freely available for use and reuse
 - b. Educational resources that are only available to a select group of people
 - c. Educational resources that are only available for purchase.

Section – B: Usage of National & International OERs

8. Have you ever used OER in your teaching? a. Yes b. No

9. If you answered "yes" to question 8, how often do you use OER in your teaching? a. Rarely
b. Occasionally c. Frequently
10. Are you aware of any OER repositories or platforms where you can find OER? a. Yes b. No
11. If you answered "yes" to question 10, which OER repositories or platforms are you aware of?
12. Have you received any training or professional development on OER? a. Yes b. No
13. Are you adopting OER (a) Before the Pandemic (b) After the Pandemic (c) Never
14. Do you think that OER can be a valuable resource for teaching and learning? a. Yes b. No
c. Not sure
15. If you answered "yes" to question 14, for what content you utilized OER? To obtain
 - a. Images (pictures, photographs, including from the web)
 - b. Presentation (e.g. power Point, including from online sources)
 - c. Word Films (activities sheets,/handouts/ notes)
 - d. Digital films/Videos (e.g. from YouTube / Vimeo)
 - e. Audio Recordings
 - f. Simulation and 2D/3D animation
 - g. Learning Management system? CANVAS – Commons
 - h. Open textbook
 - i. Blogs
 - j. Microblogging
16. How often do you use the following OER platforms for your teaching and learning?

OER PROVIDERS / PLATFORM	Always	Often	Sometimes	Rarely	Never
OER common					
Saylor Academy					
WikiEducator					
OpenStax College					
BC Campus Open textbooks					
MIT open Courseware					
Open Learn , UK					
Collage Open Textbook					
Directory of Open Access Journals					
Directory of open Access Books					
MERLOT					
NPTEL					
NIOS					
NCERT					
SWAYAM					
TREE					

Section – C: Quality

17. Have you Created and Shared the Following teaching and learning materials?
 - a. Images (pictures, photographs including from the web)
 - b. Presentation (e.g. PowerPoint including from online sources)
 - c. Word files (activity sheets/handouts/ notes)
 - d. Digital Films
 - e. Audio Recordings
 - f. Simulations and 2D/3D animation
 - g. Blogs
 - h. Course packs

18. How did you select the OER? a. Based on the recommendation of colleagues or experts in the field b. Based on the search results of OER repositories or search engines c. Based on personal experience and knowledge of the subject area d. Other (please specify)
19. Have you evaluated the quality of the OER you used? a. Yes b. No
20. If you answered "yes" to question 19, which quality criteria did you consider? (Select all that apply) a. Authority of the author or creator b. Accuracy of the information c. Relevance to the course and needs of students d. Currency and timeliness of the information e. Accessibility for all students f. License and copyright permissions g. Other (please specify)
21. How satisfied were you with the quality of the OER you used? a. Very satisfied b. Somewhat satisfied c. Neutral d. Somewhat dissatisfied e. Very dissatisfied
22. Would you recommend the OER you used to other faculty members? a. Yes b. No
23. Have you created or contributed to the development of OER? a. Yes b. No
24. If you answered "yes" to question 23, how did you ensure the quality of the OER you created or contributed to?
25. How important do you think it is to evaluate the quality of OER before using them in teaching? a. Very important b. Somewhat important c. Not very important d. Not important at all.

Section-D: Adoption policy

26. Whether your institute is having any OER Adoption Policy (a) Yes, (b) No
27. If you answered "yes" to question 26 whether you are part of this policy creation (a) Yes, (b) No
28. Whether any incentive provided to you for developing OER (a) Yes, (b) No
29. If you answered "yes" to question 28, whether the incentive is monetary, (a) Yes, (b) No.
30. If you answered "No" to question 29, What incentive was provided to you?

Data analysis

A total of 30 questions were grouped into four sections to study their awareness, usage, quality and adoption. This study focuses on assessing the effectiveness of the proposed conceptual framework using the data collected which contributes to the further development and revision of the framework. A total of 1633 faculty members submitted the fully filled-in questionnaire. The response was collected through Google Forms, hence the graphical representation of the quantitative data was automatically generated. The proportion of male and female faculty members is 66% male and 34% female shown in Figure 3. The data were categorized into main codes based on the four elements of the reports described in the research questions (Awareness, International & National adoption, Quality and Policy). The data analysis was carried out to understand the alignment with the OER adoption pyramid framework concerning awareness, capacity, availability and volition. It facilitated customizing the framework based on the reported data.

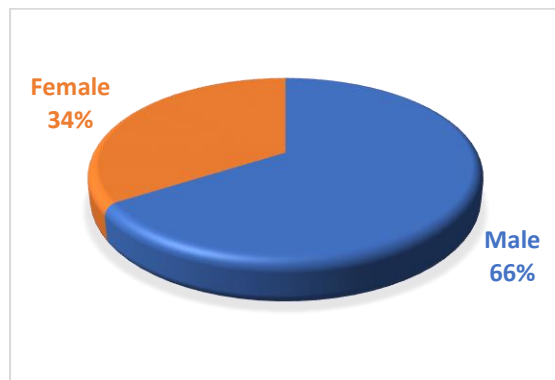


Figure 3a: Gender

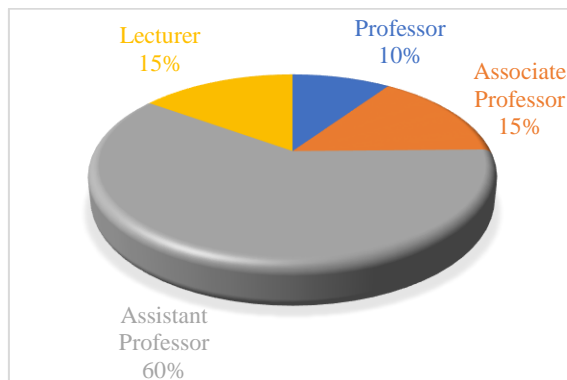


Figure 3b: Designation of faculty members

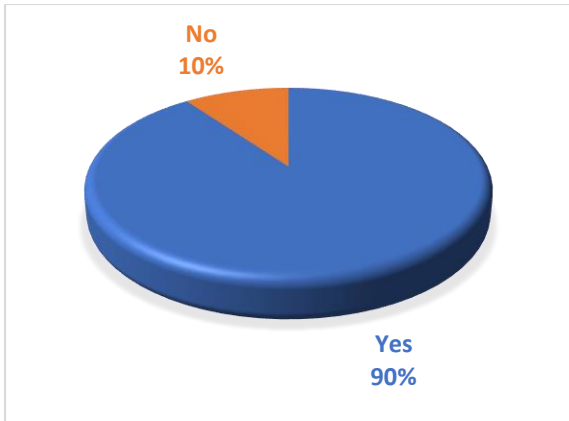


Figure 3c – Awareness of OER

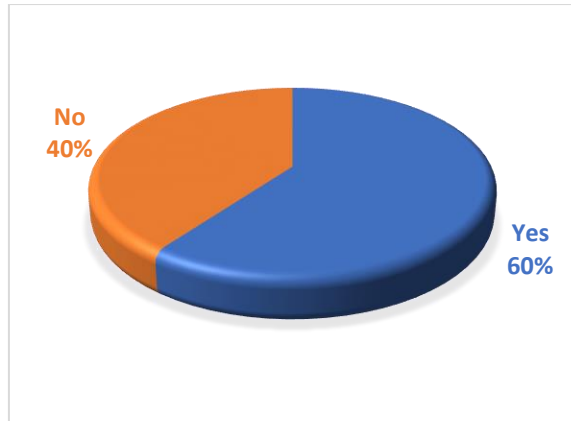


Figure 3d – Usage of OER for teaching

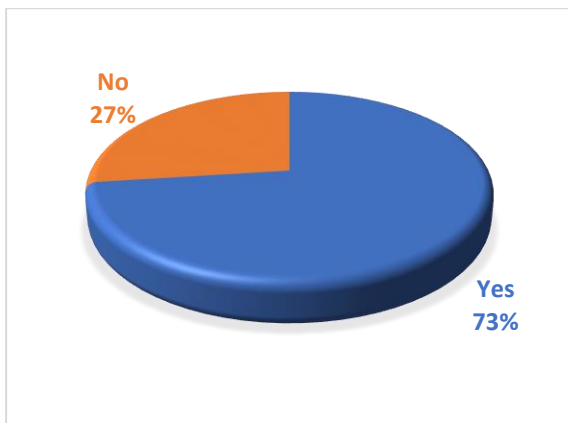


Figure 3e – Trained on OER Tools

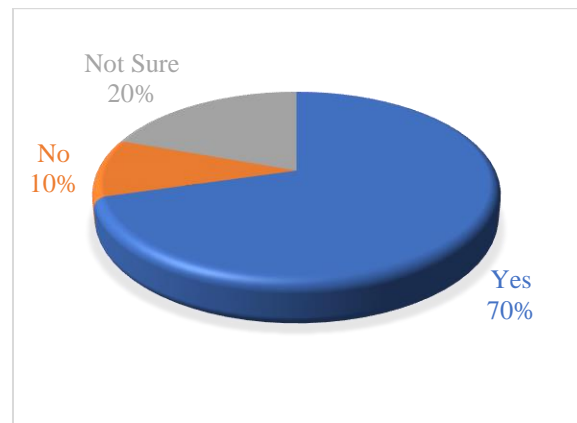


Figure 3f- OER valuable resource for TL

How often to you use the following OER platforms for your teaching and learning?

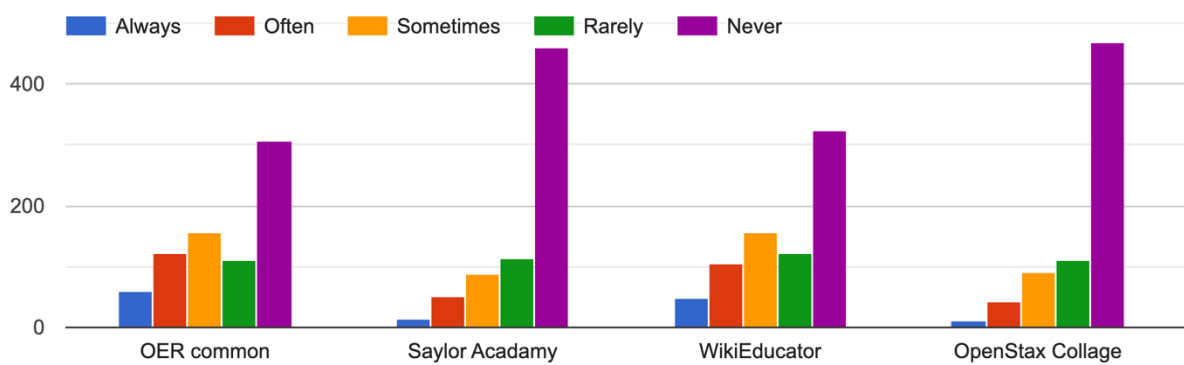


Figure 3g (i)- OER Platform used for teaching and learning

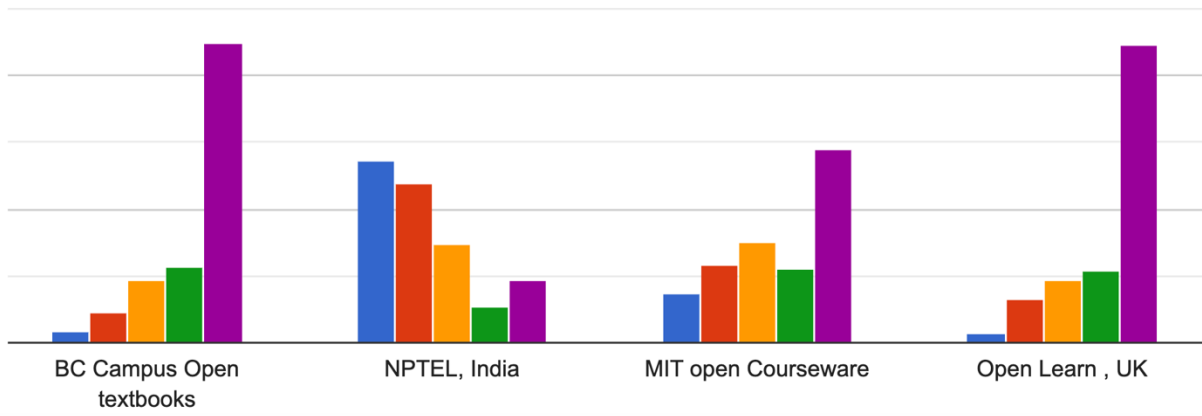


Figure 3g (ii)- OER Platform used for teaching and learning

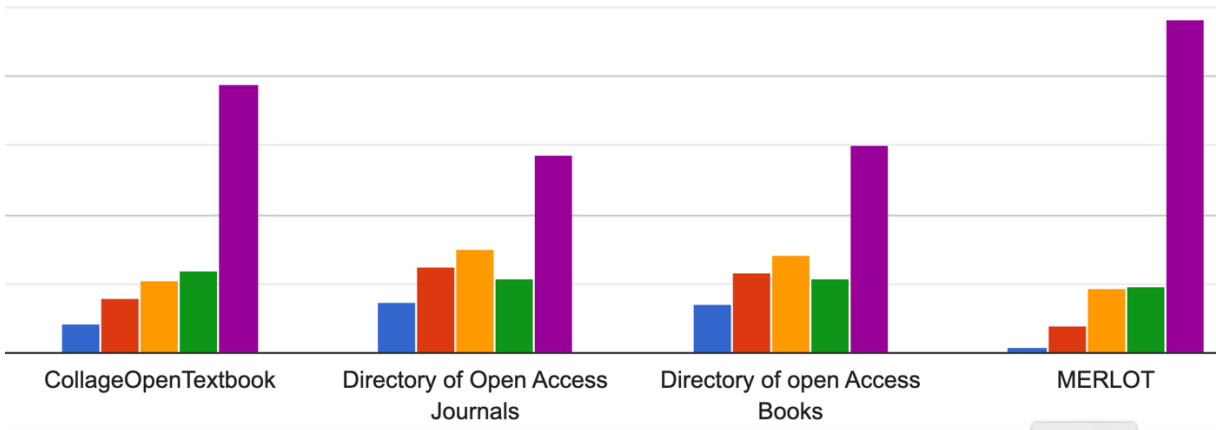


Figure 3g (iii)- OER Platform used for teaching and learning

What for and how often OER is used in teaching?

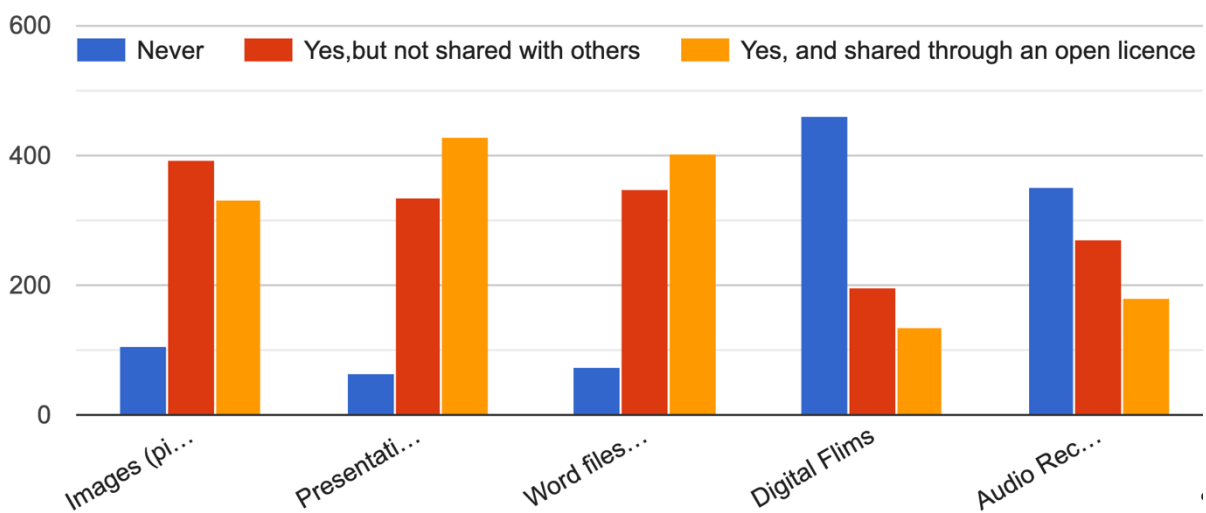


Figure 3h (i)- Type of OER used in teaching

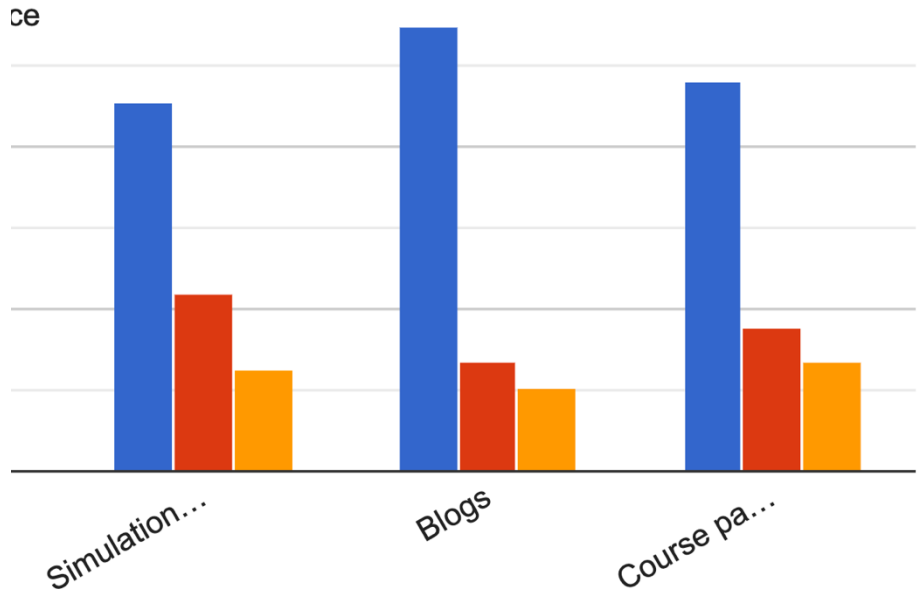


Figure 3h(ii)- Type of OER used in teaching

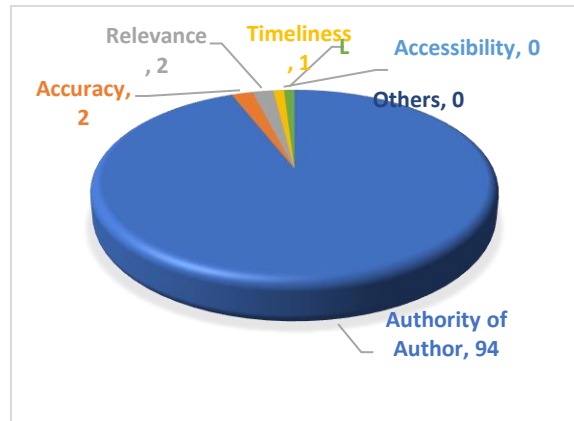
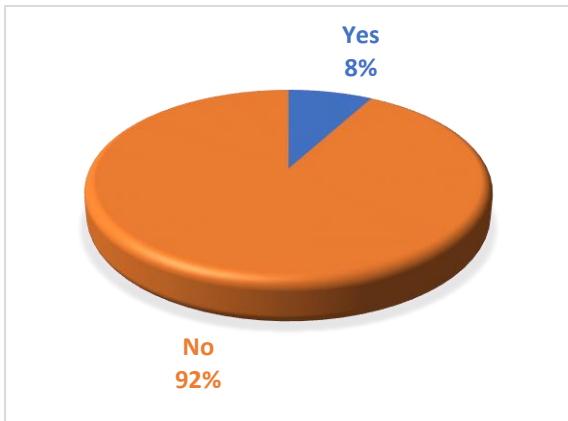


Figure 3i- Have you evaluated the quality of OER Figure 3j- Criteria for OER quality evaluation

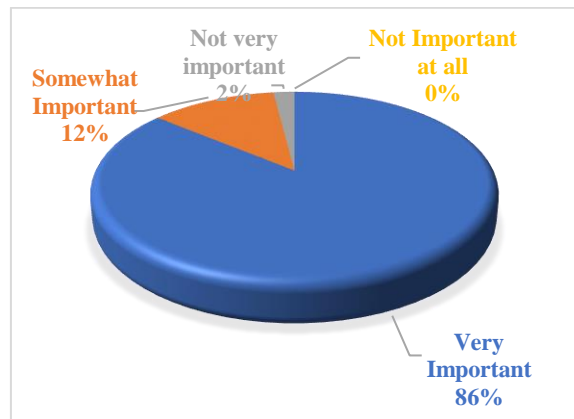
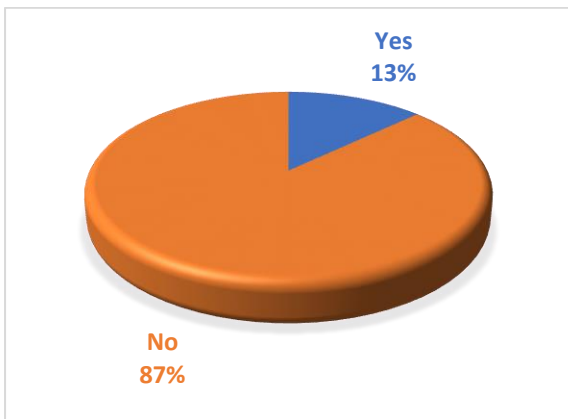


Figure 3k – Have you developed OER Figure 3l- Quality of OER with respect to teaching

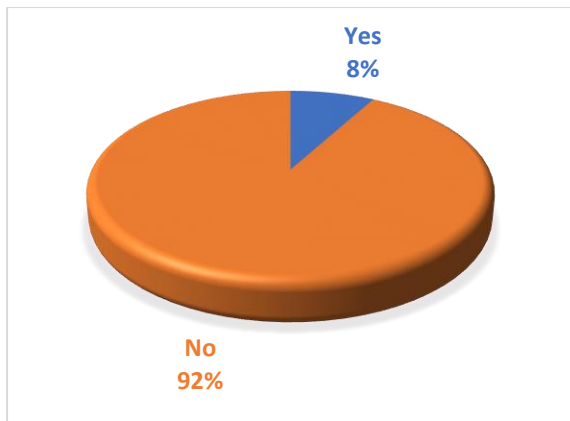


Figure 3m- Institute possess OER adoption policy

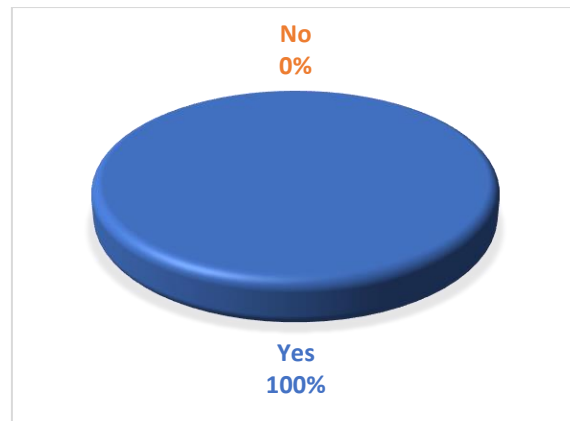


Figure 3n-Incentive for developing OER

Figure 3: Visualization of questionnaire response.

Findings and Conclusion

Based on the study, it is observed that awareness and adoption of OER increased after the pandemic. The predominant cadre of faculty is a lecturer and assistant professor who accounts for around 75% and the age group is less than 35 years. The senior faculty members did not know and adopt the OER even after the pandemic. Approximately 70.5% of the faculty members were aware of OER before the pandemic but never utilized it effectively, 19.5% of faculty members used it before the pandemic at a minimum level, and 10.5% never utilized the OER. The access to the library and bookstores facilitated faculty members and students to adopt online resources. The utilisation of national OER was predominant due to its relevance and adaptability of the content when compared to international OER. More than 70% of usage is related to OER Textbooks, followed by presentations, images and then video material. The textbook in regional languages was utilized by more than 36%. The international OER is utilized for content upgradation and to have a holistic perspective. International OER is preferred only by 18% of the faculty members who participated in the survey. The quality evaluation of OER is important from the user's perspective, it is adopted primarily based on the author's reputation and relevance to the region-specific. It is an important parameter to help learners and faculty members to find quality OER. During the development of OER, the quality is ensured based on the content structure, learning content, assessment and reviewers' profile. The Policy of adoption at the institutional level is as low as 8% and predominantly faculty members are associated as a member to comment upon the developed document rather than part of the developing team. The study contributed to the literature by providing new insights into the factor influencing OER awareness, and adoption. It also provides a revision of the OER adoption hierarchy framework and it is rechristened with four layers of Awareness at the base followed by quality metrics for OER, with conducive supportive policy integrated with incentives and at the pinnacle as a contributor of their own volition. The long-term impact visualized after the COVID-19 pandemic lead to practice at the micro level with the transformation from adopters to creators of OER. This study contributed to the literature by providing new insights into the factors that influence OER adoption by faculty members of different branches, cadres and age groups.

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