Postgraduate Student's Open Educational Practices and Hurdles among Faculty of Science at Alagappa University during the Pandemic

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***Abstract*—This study aims to analyze the practices and hurdles of open educational resources (OER) among faculty of science postgraduate students at Alagappa University, Tamilnadu, India, during the pandemic period. The present study has employed the "questionnaire" as a tool developed by the investigator through a systematic and comprehensive approach in the research design of the questionnaire forms for the survey in various phases. The investigator conducted a pilot study in different Alagappa University, India, departments. The faculty of science students of Alagappa University, Tamilnadu, India, has been selected for the population of the study. A total of 396 postgraduate faculty of science students from the departments chosen at Alagappa University, Tamilnadu, India, were initially collected. However, 30 samples were excluded due to incompleteness. A simple random sampling method was employed to select 366 data for the study. All faculty of science students at Alagappa University, Tamilnadu, India were aware of OER. However, one-fourth of students rarely used OER per day, and only a few students used it monthly. OER was taught to students by faculty at Alagappa University, which created awareness and usage of OER. More announcements or news about OERs being posted on official university websites would increase student awareness of OERs. The significant hurdles shared by students in this study in using OERs are the low quality of OER, limited technology, the OER repository, and the time-consuming to download OER resources.**

***Index Terms*—Massive open online courses, open educational resources, open educational practices, science students**

I. Introduction

Open Educational Resources (OER) is a term coined by UNESCO in 2002 [1], referring to all the freely accessible online educational materials [2]. It should adopt the 5Rs conditions mentioned in the OER that allow retaining, reusing, revising, remixing, and redistributing a rich collection of openly licensed resources [3, 4]. OER encompasses all types of textbooks, course materials, images, videos, games, Audio/Video lectures, open software, simulations, research data, research papers, research outputs, etc. [5, 6]. It is digital and free of charge to all [7–9]. OER has significantly contributed to providing quality learning resources at Alagappa University, Tamilnadu, India [10]. The appropriate use of OER can widen access to education, reduce costs, and improve the quality of education in India [11]. Quality of education improves when instructors and learners can easily access resources they could not access due to high costs and copyright laws [12]. Education has witnessed a significant paradigm shift in teaching methods and educational resources. Access to e-resources is better suited for users connected to a university or corporate network when a library chooses to use a specific authentication and authorization method. By implementing this method, the library can ensure that access to its digital resources is secure and dependable [13, 14].

In today's environment, users often link to resources remotely from home, coffee shops, or other locations. While some current methods in wide use for accessing e-resources have traits that help protect patron privacy, they can also have traits that may hinder it. The program allows librarians to develop expertise in developing OER initiatives on their campuses [15, 16]. The new education system emphasizes online-based teaching-learning approaches [17]. We must also bring the most extraordinary transformation in the future school sector [18]. It is an open educational resource that includes classes and programs, curricula, didactic modules, student guidelines, textbooks, articles in research, videos, podcasts, assessment tools, interactive material (simulations), databases, software, applications, and all other educational matters [19]. Open education services consist of education content, software, resources for an application, and external links [20].

OER with teaching methods is problematic but can effectively foster learning when adequately implemented. "OER" is the standard solution for all disasters that impact students' education (viral outbreaks, war, flooding, rain, recession, famines, storms, etc.). Teachers using the Internet can utilize asynchronous discussions, real-time chat, online testing, and document sharing. These Internet tools may sometimes refer to as Web-based or Web-supported technology. Free online education may enhance the educational experience through computer-communications technology, but face-to-face expertise is still required [21], [22]. Parents in India are protesting the online learning strategy during the COVID-19 pandemic, according to the Indian Ministry of Higher Education. Parents are pushed for complete control over their children rather than traditional learning. As a result, it is critical to identify the parents' role when their children utilize e-Learning during COVID-19 [23, 24]. The present study aims to discover the Practices and Hurdles of Open Educational Resources (OER) among Post Graduate students of the Faculty of Science at Alagappa University, Tamilnadu, India, during the pandemic period [25].

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II. Related Literature Review

Higher education institutions, students, and their use of resources have to find ways of overcoming the challenges in Tanzania. Moreover, institutions must improve the reliability and speed of the internet within their institutions and equip instructors with the necessary skills to create and use OER to update relevant policies to enable the smooth implementation of OER [26]. In addition, the faculty members' awareness of OER needs to be improved, especially their awareness of OER-related tools and license terms [27]. Finally, faculty members need more opportunities to participate more fully in OER-related practices [19]. For instance, they might employ OER in online and blended teaching forms to increase OER's perceived attributes and encourage them to develop and use OER [28]. A university is a crucial setting for students to learn about OER. In Chinese higher education, OER was mainly used as a supplemental learning tool and had not been integrated into the regular curriculum [29, 30]. Therefore, universities should implement unique OER introduction programs for their students to increase OER's impact and successfully advance quality education reforms in higher education. The OER usage requires adaptation to local languages, cultures, and educational contexts. Then they found the requirements of specific digital skills, ICT resources, time, and organizational resources [1]. User authentication issues are common failures that prevent users from successfully accessing e-resources. The University of Minnesota developed a checklist of essential skills and tools to resolve these issues. Finally, the users reported access issues through a "Report a Problem" form, a link present only in the electronic resource records of their discovery tool [31].

An online educational resource is crucial in developing future English teachers' communicative language abilities. Furthermore, their use in the instruction process gives university lecturers a wide range of opportunities to improve the four language skills of their students [32]. However, there needs to be a more significant gap in how students at different educational levels and fields view the advantages of using OER [33]. For example, social science and female students better perceive the benefits of OER than other academic subjects and their male counterparts. In addition, respondents cited a need for internet access as the primary challenge to making effective use of OER, followed by a lack of time and expertise in using OER [29].

Overall, faculty believed that their efforts benefited students, including student savings, increased access to higher education, and increased engagement while allowing faculty to have greater control over their courses [34]. Investigated K-12 teachers' barriers to implementing OER, identified three types of teacher profiles, and revealed how different shapes impacted the effectiveness of OER in teaching and learning, increasing the need for appropriate OER and teachers' low intention of creating and sharing OER [35]. The practitioners are helping teachers to overcome barriers in implementing OER in K-12 settings and developing an Undergraduate Business Course Using Open Educational Resources [36]. An essential contribution of this research is the extension of the definition of OERs to include publicly available resources. This paper reports on the process and students' perceptions about the inclusion of OERs in their courses [35]. Recommendations for further research and practice are shared. Investigated students' satisfaction and performance in the OER-integrated online calculus course [30]. This study involved eight students taking a calculus course online [37]. The lecturer used various OER integrated into Canvas, and during the online meetings, students were satisfied with the online calculus course since it met their expectations [30].

III. Objectives of the Study

The objectives of the present study are as follows:

- To determine the awareness and frequency of using OER among Post Graduate Students of the Faculty of Science at Alagappa University, Tamilnadu, India.
- To find out the tools for accessing and utilizing OER among Post Graduate Students of the Faculty of Science at Alagappa University, Tamilnadu, India.
- To find out the channels and the purpose of using OER among Post Graduate Students of the Faculty of Science at Alagappa University, Tamilnadu, India.
- To find out the number of Faculty of Science Post Graduate Students Enrolled, Completed, and Discontinued in MOOC at Alagappa University, Tamilnadu, India.
- To find out the practices and hurdles of OER among Post Graduate Students of the Faculty of Science at Alagappa University, Tamilnadu, India.

IV. Methodology

The present study aims to determine the practices and hurdles of OER among Faculty of Science Post Graduate Students at Alagappa University, Tamilnadu, India. The study undertakes the sampling method and attempts to determine the postgraduate students' practices and hurdles of open educational resources through appropriate methodological and statistical procedures. The present study has employed the "questionnaire" as a tool developed by the investigator through a systematic and comprehensive approach in the research design of the questionnaire forms for the survey in various phases. Thirty Master of Science students were surveyed to develop instruments for practices and barriers to open educational resources. The information is collected from different sources based on their views and opinions. In addition, the investigator conducted a pilot study in Alagappa University's various departments. Their responses determine the need to restrict the questionnaire, re-sequencing the questions, add, and delete queries, give more instructions for filling up, etc.

Further, the pilot study will highlight the questionnaire response's weaknesses and the necessary modifications that changed. The investigator used the split-half method. The investigator split the odd items and even items. The correlation coefficient is identified by using the Spearman-Brown Prophesy formula. The reliability value is calculated as follows.

The correlation coefficient value is $r = 2r/ (l + r)$, $r = 0.746$. The faculties of science postgraduate students of Alagappa

University, Tamilnadu, India, have been selected for the population of the study. The investigator visited the department and obtained prior permission from the authorities to collect the required data from the postgraduate faculty of science students. The researcher provided brief instructions before collecting data on the outline of open education resources and practices to the faculties of Master of Science students of Alagappa University, Tamil Nadu, India. After the exposure, the questionnaire is given to the respondent to be filled up and collected. The same work is followed in all the science departments. A total of 396 postgraduate faculty of science students from the departments chosen at Alagappa University, Tamilnadu, India, were initially collected. However, 30 samples were excluded due to incompleteness. Therefore, a simple random sampling method was employed to select 366 data for the study. The study population is the "post graduates' students from Mathematical science, Physical science, Chemical science, Computational science, Biological science, and Marine Science in Alagappa University, Tamilnadu, India." The present study includes demographic variables: Gender, Age Group, Student Native, and Department. The statistical techniques used for analyzing the data for the present study were percentage, frequency, mean, standard deviation, ANOVA and mean score analysis. The data is explored through the new version of SPSS Statistics 29. It can provide more accurate and precise data analysis.

V. Data Analysis and Interpretation

Fig. 1 shows the details of respondents' distributions in demographical variables of Gender, Age, Native, Department, and Degree. Gender differences from the analysis interpreted that among 366 respondents, 199 (54.4%) were male and 167 (45.6%) were female. Age differences responses from the study analyzed that 291 (79.5%) were between Below 21–25 Years, 61 (16.7%) were between 26–30 Years, and 14(3.8%) were between 31– Above 40 Years. Students' Native responses from the analysis interpreted that 203 (55.5%) were from Rural, 92 (25.1%) were from Urban, and 71 (19.4%) were from Semi-Urban. Finally, Department responses from the analysis interpreted that 44 (12.0%) were from Mathematical sciences and 58 (15.8%) were from Physical sciences, 52 (14.2%) were from Chemical sciences, and 72 (19.7%) were from Computational sciences, 98 (26.8%) were from Biological sciences, and 42 (11.5%) were from Marine sciences.

Fig. 2 illustrates the respondents' awareness and their frequency of using OER. 56.8% responded, "I know somewhat," and 43.2% answered, "I know very well." Therefore, it is revealed that all the respondents are aware of OER. Further, it is noticed that in the frequency of using OER, it is evident that 41.3% of respondents are frequently operating in a day, 35.2% are rarely using, 22.7% are used weekly, and 8% are used monthly.

Fig. 3 depicts the frequency of respondents enrolled in MOOCs [38]. It is clear that 53.6% of the respondent enrolled in more than one course, 35.5% of the respondents have enrolled in one course, and 10.9% have not enrolled in any of the courses. Further, it is clear from the frequency of respondents who completed MOOC it is clear that 52.7% of the respondents completed one course, 34.3% of the respondent have completed more than one course, and 12.8% have not completed any courses. Finally, 11.3% of the respondents' discontinued one course, 1.5% of the respondents discontinued more than one course, and 87.1% have not discontinued any course [39].

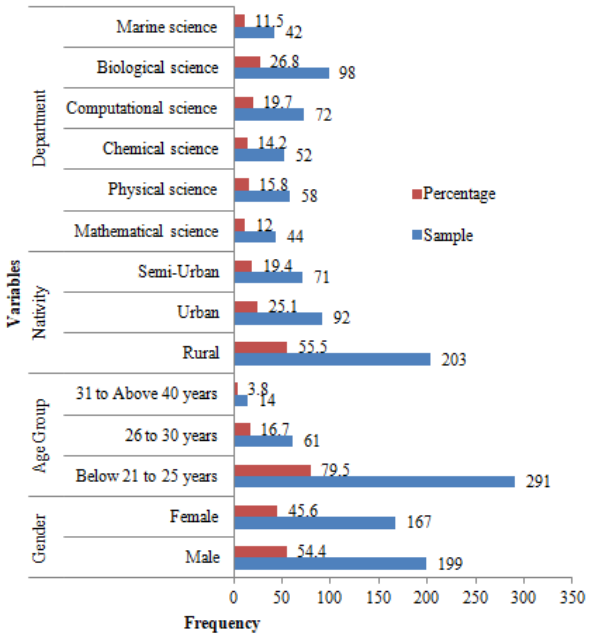

Fig. 1. Demographics distribution of respondents.

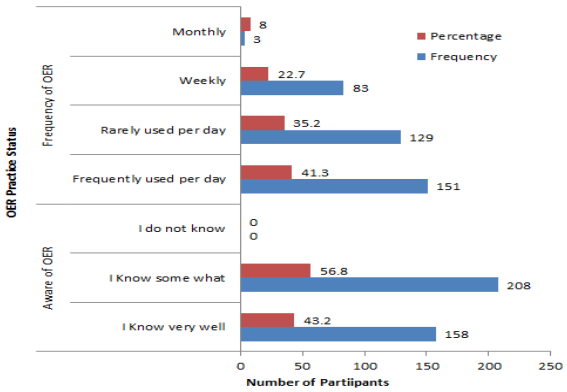

Fig. 2. Distribution of respondent's awareness and frequency of using OER.

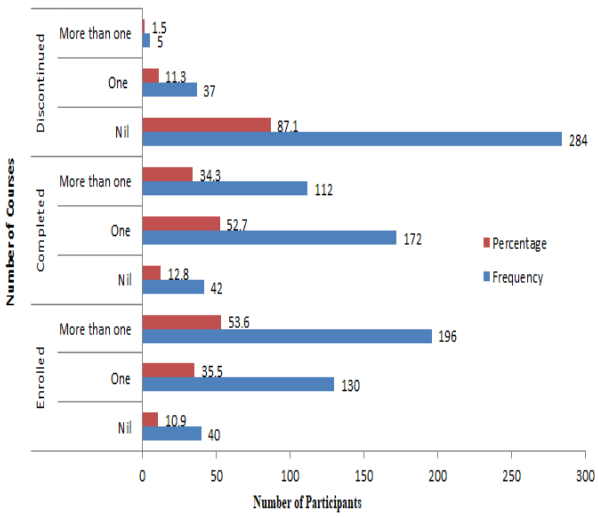

Fig. 3. Frequency of respondents enrolled, completed and discontinued in MOOC.

Fig. 4 shows that 53.3% of respondents use smartphones effectively to access OER, followed by desktop/laptops 41.7%, IPad 4.6%, and tablet computers 1.4%. 27.8% of the respondents know about OER from their classmates, followed by faculty members 26.2%, social media 23.9%, and university website 22.1%. The data on respondents' utilization of OER shows that 99.7% of the respondents use Swayam. 93.4% use E-PG Pathshala, and 89.6% use the national digital library. 89.3% of the respondents use NPTEL, and 61.2% use Shodhganga. 49.2% use NCERT, and 18.3% use Swayam Prabha. 7.1% of the respondents use Vidya Mitra, 5.7% use Krishikosh, 4.6% use mooKIT, 4.1% use MHRDs Virtual Labs, and (3.6%) of the respondents use IITBombayX.

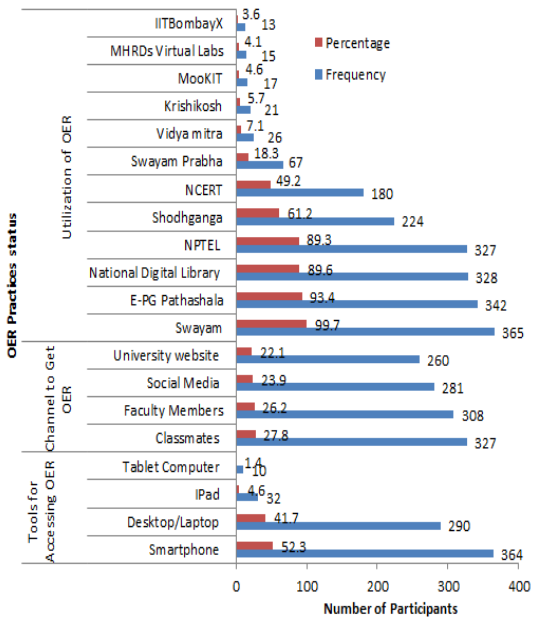

Fig. 4. Distribution of respondent tools to access, channel to get OER and their utilization of OER.

Table I and Fig. 5 extracts the details purpose of using OER: Preparing for class material mean value is 1.97, and the standard deviation value is 1.062. The majority of 149 (38.8%) respondents disagree with this statement. Preparing for the conference paper's mean value is 3.95, and the Standard Deviation value is 0.877. Foremost of 162 (44.3%) respondents agree with this statement. The mean value for preparing the project is 3.72, and the standard deviation is 0.893. A significant 170 (46.4%) respondents strongly agree with this statement. Preparing for lecture notes mean value is 2.87, and the standard deviation is 1.345. Most 105 (28.7%) respondents strongly disagree with this statement. Finally, preparing for assignment notes indicates a mean value of 3.54, and the standard deviation is 1.064. Again, 149 (38.3%) respondents agree with this statement.

TABLE I: RESPONDENTS PURPOSE OF USING OER

Statements	Mean	SD
Preparing for Class Material	1.97	1.062
Preparing for Conference Paper	3.95	0.877
Preparing for Project	3.72	0.893
Preparing for Lecture notes	2.87	1.345
Preparing for Assignment	3.54	1.064

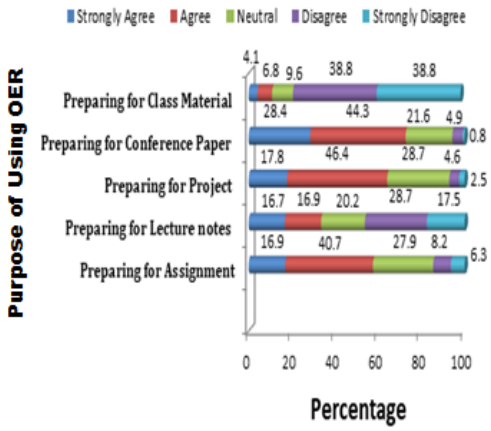

Fig. 5. Respondent's purpose for using OER.

TABLE II: ONE-WAY ANOVA ON HURDLES OF OERS WITH RESPECT TO AGE GROUP

Hurdles of OER		Sum of Squares	df	Mean Square	F	Sig.
Low awareness	Between Groups	7.261	2	3.630	4.318	0.014*
	Within Groups	305.179	363	0.841		
	Total	312.440	365			
Quality of OER may not be authentic	Between Groups	4.479	2	2.239	1.100	0.334*
	Within Groups	739.076	363	2.036		
	Total	743.555	365			
Technological limitations are limited	Between Groups	5.805	2	2.902	2.903	0.056*
	Within Groups	362.897	363	1.000		
	Total	368.702	365			
OER repository is not updated frequently	Between Groups	0.787	2	0.394	0.429	0.651*
	Within Groups	332.931	363	0.917		
	Total	333.719	365			
It is time consuming to download OER resources	Between Groups	5.581	2	2.791	1.630	0.197*
	Within Groups	621.383	363	1.712		
	Total	626.964	365			
It is challenging to visit the websites of OER	Between Groups	0.440	2	0.220	0.116	0.890*
	Within Groups	686.467	363	1.891		
	Total	686.907	365			
No faculty members encouraged me to use OER.	Between Groups	2.883	2	1.441	0.781	0.458*
	Within Groups	669.524	363	1.844		
	Total	672.407	365			
Sustainability of OER initiatives	Between Groups	2.250	2	1.125	.702	0.496*

	Within Groups	581.468	363	1.602		
	Total	583.719	365			

**1% level of significance *5% level of significance

The ANOVA test measures differences between students' age and the variable. The P-value of the Low variable awareness is less than 0.05, at a 5% significance level. Hence the null hypotheses for these variables are rejected. It is concluded that there is a significant difference between this variable and the age of the respondents. The p-value of the variables' Quality of OER may need to be more authentic. This research found that technological limitations are limited; the OER repository must be updated frequently, and time-consuming to download OER resources. It is challenging to visit OER's websites; no faculty members encouraged me to use OER, and the sustainability of OER initiatives is more than 0.05, at the 5% significance level. Hence the null hypotheses for these variables are accepted. It concludes that there is no significant difference between these variables and the age of the respondents.

TABLE III: POST-HOC TUKEY HSD TABLE FOR ANOVA TEST OF BETWEEN AGE GROUP

Dependent Variable	Age Group	Age Group	Mean Difference	Std. Error	Sig.
Low awareness	21 to 25 Years	26 to 30 Years	−0.379*	.129	0.010
		31 to 40 Years	−0.050	.251	0.978
	26 to 30 Years	21 to 25 Years	0.379*	.129	0.010
		31 to 40 Years	0.329	.272	0.447
	31 to 40 Years	21 to 25 Years	0.050	.251	0.978
		26 to 30 Years	−0.329	.272	0.447

*. The mean difference is significant at the 0.05 level.

The post-Hoc Tukey HSD test was used to test the significant difference between the groups based on the mean difference. For example, Below 21 to 25 years respondents have a more mean (M) difference than 26 to 30 years and 31 to Above 40 years. Therefore, it concludes that Low awareness is the main Hurdle in the age group Below 21 to 25 years.

TABLE IV: ONE-WAY ANOVA ON HURDLES OF OERS WITH RESPECT TO STUDENT'S NATIVITY

Hurdles of OER		Sum of Squares	df	Mean Square	F	Sig.
Low awareness	Between Groups	0.895	2	0.447	0.521	0.594*
	Within Groups	311.545	363	0.858		
	Total	312.440	365			
Quality of OER may not be authentic	Between Groups	7.260	2	3.630	1.790	0.168*
	Within Groups	736.295	363	2.028		
	Total	743.555	365			
Technological limitations are limited	Between Groups	11.931	2	5.965	6.069	<0.003**
	Within Groups	356.772	363	0.983		
	Total	368.702	365			
OER repository is not updated frequently	Between Groups	2.219	2	1.109	1.215	0.298*
	Within Groups	331.500	363	0.913		
	Total	333.719	365			
It is time consuming to download OER resources	Between Groups	3.910	2	1.955	1.139	0.321*
	Within Groups	623.054	363	1.716		
	Total	626.964	365			
It is challenging to visit the websites of OER	Between Groups	3.910	2	1.955	0.249	0.780*
	Within Groups	623.054	363	1.716		
	Total	626.964	365			
No faculty members encouraged me to use OER.	Between Groups	2.181	2	1.090	0.591	0.555*
	Within Groups	670.226	363	1.846		
	Total	672.407	365			
Sustainability of OER initiatives	Between Groups	2.489	2	1.244	0.777	0.461*
	Within Groups	581.230	363	1.601		
	Total	583.719	365			

**1% level of significance
*5% level of significance

The p-value of the Technological variable limitations is limited to less than 0.01, at a 1% significance level. Hence the null hypothesis is rejected. It concludes that there is a significant difference between this variable and student nativity. The quality of OER may not be authentic. The OER repository needs to be updated more frequently. It is time-consuming to download OER resources. It is challenging to visit the websites of OER. No faculty members encouraged me to use OER, and the Sustainability of OER initiatives is more than 0.05 at the 5% significance level. Hence the null hypotheses for these variables are accepted. It concludes that there is no significant difference between these variables and the student nativity of the respondents.

TABLE V: POST-HOC TUKEY HSD TABLE FOR ONE-WAY ANOVA TEST OF BETWEEN STUDENTS NATIVITY

Dependent Variable	Age Group	Age Group	Mean Difference	Std. Error	Sig.
Low awareness	21 to 25 Years	26 to 30 Years	−0.379*	0.129	0.010
		31 to 40 Years	−0.050	0.251	0.978
	26 to 30 Years	21 to 25 Years	0.379*	0.129	0.010
		31 to 40 Years	0.329	0.272	0.447
	31 to 40 Years	21 to 25 Years	0.050	0.251	0.978
		26 to 30 Years	−0.329	0.272	0.447

The mean difference is significant at the 0.05 level.The post-Hoc Tukey HSD test was used to test the significant

difference between the groups based on the mean difference. Rural native respondents have a more mean (M) difference than urban native and Semi-Urban native respondents. Therefore, it is concluded that rural native is the foremost hurdle to the limited technological limitations.

VI. Result and Discussion

The study investigated the extent to which Alagappa University postgraduate science students use OERs, and the hurdles they face in their institutional repositories. Table II revealed that all science students know OER at Alagappa University, Tamilnadu, India. This study found that approximately one-third of Alagappa University science students used OER weekly. About one-fourth of students rarely used OER per day, and very few students used it monthly. Compared to the daily attendance of students in the classroom, OER is yet to be a significant source of learning. However, students are still required to participate in regular classroom activities, and OER continues to serve as a source of optional supplemental education.

This study found that one-fifth of Alagappa University postgraduate science students have enrolled in more than one course, about one-third of students enrolled in a single course, and some were not interested in enrolling in the course. Regarding the completion of Massive Open Online Courses, this study found that one-fifth of the students completed one course, about one-third of students completed more than one course, and about half still needed to complete their courses regarding the discontinuation of Massive Open Online Courses. In addition, this study found that one-eighth of the students have not discontinued, about half have suspended a single class, and some have discontinued more than one course. One of the most often used types of multimedia is video. Recently, there has been a widespread shift toward documenting training and education via video. This result reaffirmed that video is the preferred medium for online learning.

MOOC enrollment rate has decreased significantly since the COVID-19 outbreak; however, the completion rate has remained relatively stable. The main reason for this decrease in enrollment is the increased uncertainty and anxiety among students about the future. In addition, the pandemic has made it difficult for students to access MOOCs, as many of them cannot afford the fees or have difficulty finding a reliable internet connection. There are many reasons why students discontinue or cannot complete MOOCs. One reason is that some MOOCS requires a proctored exam, and with proctoring centers closed due to the pandemic, taking these types of exams has become more challenging. Additionally, some courses require in-person attendance, which is impossible for students in different parts of the world. Furthermore, the pandemic has made it difficult for students to access MOOCs, as many of them cannot afford the fees or need help finding a reliable internet connection. Some of the reasons why students discontinue MOOC courses include the following:

- **Lack of time:** One of the main reasons students discontinue or cannot complete MOOCs is the lack of time. With the increasing demands of work and family, it is often difficult for students to find time to commit to a MOOC.
- **Lack of motivation**: Students discontinue or cannot complete MOOCs because of a lack of motivation. It is often challenging to stay motivated when taking a MOOC, especially if the course is not enjoyable or has no clear goal.
- **Technical difficulties**: Technical difficulties can also be why students discontinue or cannot complete MOOCs. If the MOOC is not well designed or has technical problems, it can be very frustrating for students and may cause them to give up.
- **Lack of support**: Lack of help from family, friends, or the MOOC provider can also be why students discontinue or cannot complete MOOCs. If students feel alone in their learning, they may be less likely to continue.
- **Cost**: Taking a MOOC can also be a barrier for some students. Although MOOCs are often free or low-cost, some costs may be associated with taking the course, such as the cost of books or materials.
- **Language**: Language can also be a barrier for some students taking MOOCs. If the MOOC is not offered in the student's native language, it can be challenging to understand the material.
- **Geography**: Geography can also be a barrier for some students taking MOOCs. If the student is not in a country where the MOOC is offered, they may not be able to take the course.
- **Employability:** One of the main reasons why students take MOOCs is to improve their employability. However, if the MOOC does not lead to a job or if the job is not what the student expected, it can be a reason why the student discontinues or does not complete the MOOC.
- **Difficulty of the material**: Another reason a student may discontinue a MOOC is the Difficulty of the material. If a MOOC is too difficult, students may become discouraged and drop out.

Regarding tools used for accessing OER by science students in Alagappa University, Tamilnadu, India, most students are accessing OER through smartphones as it is readily available and easy to use. 79.2% of students use a desktop/laptop for accessing the OER. Some students use tablet computers and IPad for accessing OER. The small sample size of this study and the participation of students make it difficult to generalize the results of this study channel to get to know OER among science students at Alagappa University, Tamilnadu, India. Publishing more OER-related announcements or news on official university websites would greatly benefit OER adoption and usage among scientific students. Students' primary sources of information about OER were university websites and peers.

The finding in utilizing OER materials among science students in Alagappa University, Tamilnadu, India, followed by most students, is Swayam online learning platform due to any-time learning access. Hence, all students adopt it quickly and find it easy to use. E-PG Pathshala study material is available, and students use the second-highest. Since all primary to postgraduate-level study materials are available in the National digital library. NDL, students use it to the third-highest level. NPTEL's online learning platform is

handy for science students. Hence, students use it as the fourth-highest learning platform. Shodhganga, Indian Electronic Theses, and Dissertations are available for visits. Hence, students use it as the fifth-highest NCERT study material. Swayam Prabha, Vidya Mitra, Krishikosh, mooKIT, MHRDs Virtual, and IITBombayX are used by some students.

Most respondents disagree with the statement that OER is used for preparing class material. The majority of respondents agree that OER is used for preparing conference papers. Most respondents strongly agree that they use OER to prepare the project. The majority of respondents strongly disagree that they use OER for lecture notes. The majority of respondents agree that they prepare their assignments using OER. This finding identified that the primary purpose of using OER was project preparation.

The significant hurdles students in this study shared in using OERs are Low awareness, Quality of OER, limited technology, the OER repository, and time consumed to download OER resources. It is challenging to visit the Websites of OER, and no faculty members encouraged me to use OER, and the Sustainability of OER initiatives, analysis of different age groups, and hurdles. Low awareness statement of limitations measures significant differences between students—P-value of the variable compared age group and barriers. Under the age of 25 years, respondents have a more meaningful distinction than 25 to 30 Years respondents Above 30 Years respondents. It concludes that Low awareness is the foremost hurdle to the less than 25 age group.

Low awareness, Quality of OER may not be authentic, Technological limitations, OER repository is not updated frequently, time-consuming to download OER resources, difficult to visit Websites of OER, No faculty members encouraged me to use OER, and Sustainability of OER initiatives, analysis different native place, and hurdles, Technological limitations are the statements of hurdles that measured significant differences between students native place and hurdles. Rural native respondents have a more meaningful distinction than urban native and Semi-Urban native respondents. It concludes that rural native is the main hurdle to the technological limitations of OER. The following is a list of OER sites accessed by the faculty of science postgraduate students at Alagappa University, Tamilnadu, India, during the pandemic. (http://oer.educatorlabs.org/;http://www.oercommons.org/;http://www.merlot.org/merlot/index.htm;http://www.oerinfokit.org/oerkit/;http://www.opencontent.org/;http://www.openebooks.net/; http://www.cnx.org/).

OERs can provide quality resources that support student learning, including resources necessary for remote learning. OERs can help ensure that students have access to quality content and provide a flexible and affordable way to learn. The current pandemic situation had a significant impact on the enrollment and completion rates of students. It has been a major hurdle for students in using OERs. The pandemic also has limited technology, which has made it difficult for students to access OER resources. Moreover, the OER repository has been time-consuming to download OER resources.

A few studies have been conducted on the usage and hurdles of open educational resources. The notable studies are listed below: The Use and Perceived Benefits of Open Educational Resources in Higher Education: A Qualitative Study [16] found that OER can offer many benefits to users, but there are still some challenges that need to be addressed before widespread adoption can occur. The Cost, Affordability, and Sustainability of Open Educational Resources: A Literature Review [39] found that OER can be a cost-effective way to provide quality educational materials, but there are still some challenges that need to be addressed in terms of affordability and sustainability. A Study of Open Educational Resources in U.S. Higher Education [31] conducted by the Babson Survey Research Group found that, while OER usage is growing, many hurdles still need to be overcome before it can be widely adopted.

Contrary to previous studies, the present study found that all the faculty of science postgraduate students at Alagappa University, Tamil Nadu, India, were aware of OER. However, one-fourth of students rarely used OER per day, and only a few students used it monthly. Faculty members at Alagappa University introduced OER to students, which increased faculty members' awareness and use of OER. In addition, more OER-related announcements or news on official university websites would raise student awareness of OERs. This finding echoes previous findings of barriers shared by students in this study, including low quality of OERs, limited technology, OER repositories, and time-consuming downloading of OER resources. The findings of this study are consistent with the existing literature on OER awareness and use among faculty of science students. The study adds to the current literature by providing insights into the practices and challenges of OER use among faculty of science students at Alagappa University, Tamilnadu, India.

VII. Conclusion

The pandemic situation collapsed the education system. OER is a beneficial study for higher institution students, particularly during a pandemic. OER is a free online teaching-learning material as we can access a lot of information freely by OER and take less time to prepare notes or collect any information. This research analyzes the practices and hurdles of OER Alagappa University, Tamilnadu, India. Faculty of science postgraduate students are aware of but not adopting. The University may create much more awareness. When Massive Open Online Courses completion is compulsory in all educational institutions, it may create awareness. The costs of textbooks and learning materials are rising, and libraries across the country are working on solutions for students and faculty by utilizing OER materials. Open educational resources that allow websites to operate for free have led libraries to collaborate with teachers. It develops programming and tutorials and facilitates publication and research in the OER field. The study emphasizes panelists from different areas in OER to talk about the present and future directions of OER research, teaching, and programming in libraries. This analysis is helpful in the clear identification of the hurdles for science students using OER. All of the above barriers must remove

for universities to reap the full benefits of an OER framework. So, Government should focus more on developing this platform as much as possible.

VIII. Future Work

A few things can be done to explore this topic further. Firstly, it would be beneficial to interview various students to get a more well-rounded perspective on this issue. Furthermore, it would be interesting to see if there are any differences in how students and faculty members perceive open educational practices. Additionally, it would be helpful to conduct this research in various contexts to see if the results are generalizable. Conducting a study on the impact of open educational practices on student learning outcomes would be beneficial. It investigates the factors that hinder the adoption of open educational practices among faculty. Examining the perceptions of students and faculty towards open educational practices would be helpful. A comparative study of open educational practices in different disciplines would be beneficial. Finally, investigating the use of open educational practices in online and blended learning environments would be interesting.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

R. Jeyshankar and M. Muniyasamy collaborated to conduct this research and develop a research question. M. Muniyasamy then analyzed the survey data and created the report, while R. Jeyshankar contributed to the research question and reviewed the survey data and report. After this, M. Muniyasamy wrote the first draft of the manuscript, which was revised by R. Jeyshankar, who provided valuable comments and suggestions. Together, they created the final manuscript. All authors read and approved the final version of the manuscript.

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