

Tapping of key innovative ICT components that make OER more acceptable to learners: Breaking the conventional mental barriers

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ABSTRACT

Open Educational Resources (OERs) has evolved as one of the most effective teaching- learning process in 21st century. However, in general there is doubt and difficulty in acceptance of OER versus conventional teaching-learning resources and instructional strategies, which has in a great way reduced interest of studies amongst learners in the pandemic. This study is aimed to find out and ratify the concern and improve the acceptance of OER as one of the potential gears of ICT driven teaching-learning resources in a blended mode. The objectives of this study were to investigate awareness & attitude towards the utilization of OER in blended learning amongst undergraduate learners of Regular and Open Higher Education Institutions (HEIs), and explore the relationship between them. A pilot method of quantitative study was carried out with 200 respondents from undergraduate learners of both Regular and Open HEIs, selected through purposive sampling. A Self-administered online based questionnaire (5- point Likert scale) in Google forms were disseminated through various social handles. The responses submitted were analyzed statistically through t- test and Pearson correlation using MS Excel & SPSS version 20. The findings exposed that there was no statistically significant mean difference in awareness & attitude towards the utilization of OER in blended learning between undergraduate learners of Regular and Open HEIs. The analyses also revealed that there was a positive correlation between awareness on OER and attitude towards OER. This study revamped the need for more popularization of the various ICT services relevant to OER in blended learning amongst learners. In general, it could be a route of acceptance and more effectiveness of the blended approach in contemporary teaching-learning practice. In support of our findings, it was found (independent of our sources), impact analyses of ICT usage during the course of study by 5922 learners of Netaji Subhas Open University has also revealed that if properly groomed and introduced, the ICT-enabled teaching-learning could revolutionize and shape instructional innovations for the millennials. Interestingly, of the 5922 respondents, 1469 were from 2019-2020 whilst 4453 in 2020-2021, reflecting the positive impact of ICT-enabled educational services and its growing acceptance along key components.

Keywords: OER, Awareness, Attitude, ICT enabled teaching-learning, Higher Education Institutions

Introduction:

Open Educational Resources (OERs) has evolved as one of the most effective teaching learning processes in 21st century. The use of online learning methods in blended learning helps the course designers in using learning materials as their preference. OERs are the type of educational materials that are used in the public domain or introduced with an open license (UNESCO, 2002). OERs are the very important component of blended learning. Blended learning is one of the most accepted learning strategies where the learners can learn using digital platform as well as the traditional classroom methods. OER have gained increased use in higher education for the potential and promise to remove demographic, economic and geographic educational boundaries and to promote lifelong learning and personalized learning in the world (Yuan et al. 2008). Awareness is a great factor that influences the utilization of resources. Without the idea on existence of the OERs, many learners might not be able to trace them and even use them for the academic work (Nyamwembe et al. 2018).

There are several major problems in Higher Education Institutions (HEIs) like lack of adequate resources, man power, funding etc. OERs can play an important role in increasing higher education enrollment rates. All the learners of HEIs can effectively access ICT tools and resources for free through Open Educational Resources. Based on different review of related literature it was found that several studies have been conducted in different states and countries about undergraduates' attitude and awareness towards the utilization of OERs for learning. Most of the studies found that learners and faculty members are in favour of utilization of OERs in their learning due to several reasons. However, in West Bengal no systematic study has been conducted on awareness and attitude towards the utilization of OERs between undergraduate learners of regular and Open HEIs.

Rationale of the study:

In the pandemic, a need was felt by the world academia to shift or rather switch to ICT based teaching-learning (T-L) components and approaches to sustain the education system. In the post pandemic era the need and importance of continuing with a systematic blended approach is being envisaged where the role of ICT will be crucial both as an accepted and integrated tool. India was no exception. West Bengal being one of the States of India also rumbled with various emergency remote teaching methods/technology across its various HEIs. As learners are one of the pivots of the T-L process, and OERs are considered to be potent e-resources for ICT based education, the present study was to delve intensely into undergraduate learners' awareness of OERs in blended mode of learning practices and also their attitude towards using them. Apropos to this, an exploration into tapping the key components of ICT in order to popularize acceptance of OERs in blended learning was a precedent to break the conventional barriers. As an exemplary, data from Netaji Subhas Open University (NSOU) were sought to revolutionize and shape instructional innovations for the millennials.

Operational Definition of the terms/concepts used in the Study:

- **Awareness:** Awareness is the state of being conscious of something. More specifically, it is the ability to directly know and perceive, to feel, or to be. In this study awareness on OER is assessed through questionnaire.
- **Attitude:** Attitude is an individual's characteristic way of responding consistently in a favourable or unfavourable manner to objects, people, or events in his environment. It is based on the individual's experience and his interpretation of it and leads to certain behaviors or opinions. In this study attitude towards OER is assessed through questionnaire.
- **Open Educational Resources (OERs):** Open Educational Resources are the materials available freely either in public domain or in an open license to use, adapt for teaching learning process and research.
- **Blended learning:** Combination of traditional methods and modern methods for teaching learning process to produce optimal learning outcome with/ without instructional technology. In this study OER is consider as a major component in blended learning.
- **Higher Educational Institution (HEI):** An Institution that imparts Under Graduate and Post Graduate courses/programmes on different disciplines/subjects.
- **Undergraduate learners: In India after passing 10+2 in Schools,** learners enter into Higher Education. Learners who are pursuing undergraduate programme/courses namely, Bachelor of Arts/Commerce/ Science (B.A/ B.Sc. / B.Com) in different HEIs (Regular/OU) of West Bengal are termed as Under Graduate learners in the present study.

Review of Related Literature:

Author/s	Year	Topic	Findings
Feldstein et al.	2012	Open textbooks and increased student access and outcomes.	More learners accessed digital Open textbooks than had previously purchased hard copies of textbooks. Higher grades were correlated with courses that used open textbooks
Lindshield & Adhikari	2013	Online and Campus College Learners Like Using An Open Educational Resource Instead of a Traditional Textbook.	The majority of learners used an electronic flexbook format and more than one flexbook format. The Portable Document Format version, followed by the Google Docs version, were the most commonly used primary formats.
Hilton et al.	2013	The adoption of open educational resources by one community college math department.	Learners who have access to open access materials collectively saved a significant amount of money. Learners and faculty were surveyed as to their perceptions of these materials and the results were generally favorable.

Bliss et al.	2013a	An OER COUP: College Teacher and Student Perceptions of Open Educational Resources.	Teachers and learners alike reported significant cost savings and various pedagogical and learning impacts due to the implementation of OER in the classroom. In addition, most learners and teachers perceived their OER to be at least equal in quality to traditional textbooks they had used in the past.
Bliss et al.	2013b	The Cost and Quality of Open Textbooks: Perceptions of Community College Faculty and Learners.	Majority of learners and faculty had a positive experience using the open textbooks, appreciated the lower costs, and perceived the texts as being of high quality.
Prince & Saravanan	2015	A Study on Awareness and Perception towards Open Access Resources among the users in the Higher Educational Institutions in Kanyakumari District.	Majority of the respondents were fully aware about open access resources and used for their academic activities and also found that the majority of the respondents were using open access resources for their course related work and satisfied its uses in their academic activity.
Author/s	Date	Topic	Findings
Nagaraj & Bhandi	2016	Use and Awareness of Open Access Resources among Researchers: a Case Study of Raman Research Institute.	More than 50% of the respondents were aware about open access resources and regularly use the contents available on open access for their academic work.
Delimont et al.	2016	University learners and faculty have positive perceptions of open/alternative resources and their utilization in a textbook replacement initiative.	Learners rated the OAERs as good quality, preferred using them instead of buying textbooks for their courses, and agreed that they would like OAERs used in other courses. Faculty felt that student learning was somewhat better and it was somewhat easier to teach using OAERs than when they used the traditional textbooks.
Cooney	2017	What Impacts do OER Have on Learners? Learners Share Their Experiences with a Health Psychology OER at New York City College of Technology.	Most learners were able to access the OER more easily than traditional textbooks and responded positively to the variety of learning materials and assignments the OER assembled.
Jhangiani & Jhangiani	2017	Investigating the Perceptions, Use, and Impact of Open Textbooks: A survey of Post-Secondary Learners in British Columbia.	The high cost of textbooks has a measurable and negative impact on the educational choices and outcomes of post secondary learners in British Columbia. Learners assigned open textbooks perceive these resources to be of generally high quality and value the cost savings, immediate access, portability, and other benefits they confer.
Watson, Domizi, & Clouser,	2017	Student and Faculty Perceptions of OpenStax in High Enrollment Courses.	Learners greatly value the quality, attributes, and the cost of the OpenStax Biology textbook, though minor concerns were raised about its online format. The student, faculty, and course benefits of this study offer a compelling argument for the

Author/s	Date	Topic	Findings
			adoption of high quality open education resources (OER) in public higher education contexts.
Nyamembe et al.	2018	Relationship between Learners' Awareness and Utilization of Open Educational Resources for Academic Work in Private Universities in Kenya.	There is a positive relationship between utilization and awareness index.
Kumar and Raja	2019	A study on awareness and attitude towards Open Educational Resources in higher education learners.	The level of awareness and attitude towards OER is moderate & it was also found that there exists a positive correlation between awareness and attitude towards OER of higher education learners.
Issa et al.	2020	Undergraduates' attitude towards the utilization of open educational resources for learning.	Undergraduate learners have a positive attitude towards utilization of OER for learning. There was difference between male and female undergraduates' attitude towards the utilization of OER for learning in favor of male undergraduates; and there were no significance differences among undergraduates based on area of specialization.
Arcebuche, and Arcebuche,	2020	Learners' Awareness and Usage of Open Educational Resources (OER) as Learning Tool in their Course Studies at the University of the Philippines Open University (UPOU).	The learners are aware of the existence of OER and consider it a useful tool for the learning process on their course of study at the University of Philippines Open University.

Objectives of the Study:

The study has two vistas:

The objectives of the first vista are-

- i. To find out the awareness on utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.
- ii. To find out the attitude towards the utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.
- iii. To explore the correlation between awareness on OER and attitude towards OER in blended learning.

The objective of the second vista of the study is-

To tap the key innovative ICT components that make OER more acceptable to earners/learners.

Hypotheses of the Study:

For the objectives of the first vista, the following research hypotheses were framed-

H₀₁: There is no significant mean difference in awareness on utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.

H₀₂: There is no significant mean difference in attitude towards the utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.

H₀₃: There is no significant positive correlation between awareness on OER and attitude towards OER in blended learning.

Variables:

- **Dependent Variable:** Awareness & attitudes towards the utilization of OERs in blended learning.
- **Categorical Variable:** Undergraduate learners of Open & regular HEIs.

Methodology:

- ✚ **Study type:** The method adopted for the study is descriptive survey method.
- ✚ **Duration of Survey:** From 2nd January to 20th January, 2022.
- ✚ **Population:** All the undergraduates student of Open and regular HEIs in West Bengal.
- ✚ **Sample:** 200 undergraduate learners from both regular (42%) and Open HEIs (58%) were selected by Purposive sampling.
- ✚ **Tools:** A self-constructed tool was developed for collecting data. Before constructing the tool, a thorough review of related studies was carried out to select possible items which would reflect the objectives of the study. The tool had three section-
 - ✓ **Part A** seeks general information about the respondents.
 - ✓ **Part B** covers 10 items with 4- point Likert scale (very aware, aware, not aware, and very unaware) related to awareness on utilization of OERs in blended learning.
 - ✓ **Part C** includes 10 items with 5- point likert scale (strongly agree, agree, neutral, disagree and strongly disagree) on attitude towards the utilization of OERs in blended learning.
- Content validity was done during initial stages of tool development. The main method to assess content validity was through expert judgment. For content validity researcher requested four experts to review the scale and assess each item based on 4 criteria including relevancy, clarity, simplicity and necessity.
- ❖ **Collection of Data:**
Keeping in mind the present circumscribed condition, the data were collected through google forms. E-Mail & social media platforms such as whatsApp, facebook were used to disseminate the questionnaire.
- ❖ **Statistical Technique Used for Data Analysis:**
Mean, Standard Deviation (SD), graphical representation, t- test and Pearson’s Product Moment Correlation. MS Excel & SPSS version 20 were employed for data analysis.

Data analysis & Interpretation:

Hypothesis 1: *There is no statistically significant mean difference in awareness on utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.*

- **TABLE 1.1: Descriptive statistics of score obtained from Open & Regular HEIs learners regarding awareness on utilization of OERs in blended learning:**

<i>Open HEIs Learners (Awareness)</i>		<i>Regular HEIs Learners (Awareness)</i>	
Mean	37.54310345	Mean	37.20238
Standard Error	0.1531245	Standard Error	0.176649
Median	38	Median	38
Mode	39	Mode	38
Standard Deviation	1.649201342	Standard Deviation	1.619012
Sample Variance	2.719865067	Sample Variance	2.621199
Kurtosis	1.682963176	Kurtosis	0.67411
Skewness	-1.237212096	Skewness	-1.05218
Range	8	Range	6
Minimum	32	Minimum	33
Maximum	40	Maximum	39
Sum	4355	Sum	3125
Count	116	Count	84

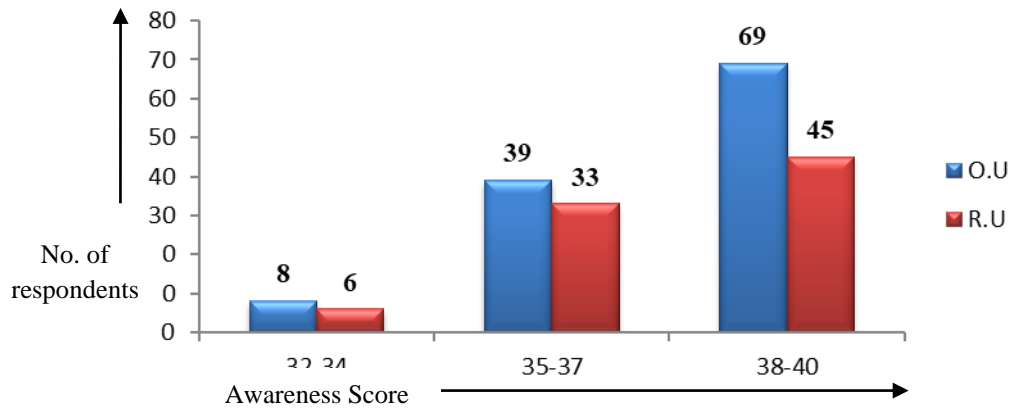
- **TABLE 1.2: Analysis of the result using t-test:**

	<i>Open HEIs Learners (Awareness)</i>	<i>Regular HEIs Learners (Awareness)</i>
Mean	37.54310345	37.20238095
Variance	2.719865067	2.621199082
Observations	116	84

Pooled Variance	2.678505084	
df	198	
t Stat	1.45314252	
P(T<=t) one-tail	0.07388361	
t Critical one-tail	1.652585784	
P(T<=t) two-tail	0.14776722	
t Critical two-tail	1.972017432	

From the above table (1.2) reveals that there is no significant mean difference in awareness on utilization of OER in blended learning between undergraduate learners' of regular and Open HEIs, as the calculated value 1.453 is lower than the table value 1.97 at 5% level of significance and hence the null hypothesis "there is no statistically significant mean difference in awareness on utilization of OER in blended learning between undergraduate learners' of regular and Open HEIs" is accepted.

➤ **FIGURE 1: Learners' Awareness on OER in Blended Learning:**



From figure 1 it was found that maximum number of O.U. (Open HEIs) learners (59.48%) and R.U. (Regular HEIs) learners (53.57%) has score 38-39. Thus the undergraduate learners have good level of awareness on OER in Blended learning.

Hypothesis 2: *There is no statistically significant mean difference in attitude towards the utilization of OER in blended learning between undergraduate learners' of regular and Open HEIs.*

➤ **TABLE 2.1: Descriptive statistics of score obtained from Open & Regular HEIs learners regarding attitude towards the utilization of OERs in blended learning:**

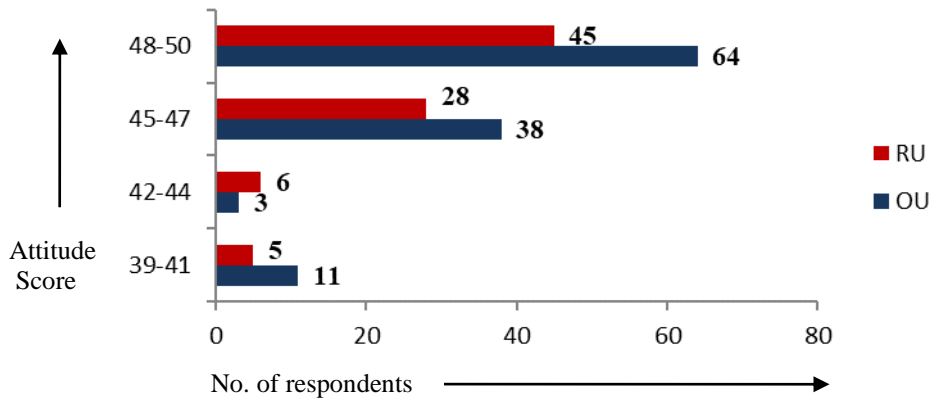
<i>Open HEIs Learners (Attitude)</i>		<i>Regular HEIs Learners (Attitude)</i>	
Mean	47.20689655	Mean	46.95238
Standard Error	0.254057697	Standard Error	0.244799
Median	49	Median	48
Mode	49	Mode	48
Standard Deviation	2.736285141	Standard Deviation	2.243624
Sample Variance	7.487256372	Sample Variance	5.03385
Kurtosis	2.303177771	Kurtosis	3.361848
Skewness	-1.786057075	Skewness	-1.85371
Range	10	Range	9
Minimum	39	Minimum	40
Maximum	49	Maximum	49
Sum	5476	Sum	3944
Count	116	Count	84

➤ **TABLE 2.2: Analysis of the result using t-test:**

	<i>Open HEIs Learners (Attitude)</i>	<i>Regular HEIs Learners (Attitude)</i>
Mean	47.20689655	46.95238095
Variance	7.487256372	5.033849684
Observations	116	84
Pooled Variance	6.458808114	
df	198	
t Stat	0.699023626	
P(T<=t) one-tail	0.242678783	
t Critical one-tail	1.652585784	
P(T<=t) two-tail	0.485357566	
t Critical two-tail	1.972017432	

From the above table (2.2) reveals that there is no significant mean difference in attitude towards utilization of OER in blended learning between undergraduate learners' of regular and Open HEIs, as the calculated value 0.69 is lower than the table value 1.97 at 5% level of significance and hence the null hypothesis "there is no statistically significant mean difference in attitude towards the utilization of OER in blended learning between undergraduate learners' of regular and Open HEIs" is accepted.

➤ **FIGURE 2: Learners' Attitude towards OER in Blended Learning:**



From figure 2 it was found that maximum number of O.U (Open HEIs) learners (55.17%) and R.U (Regular HEIs) learners (53.57%) has score 48-50. Thus the undergraduate learners have good level of attitude towards OER in Blended learning.

Hypothesis 3: There is no statistically significant positive correlation between awareness on OER and attitude towards OER in blended learning.

➤ **TABLE 3: Correlation between awareness on OER and attitude towards OER in blended learning (using SPSS version 20):**

Correlations			
[DataSet1]			
Correlations			
		Awareness	Attitude
Awareness	Pearson Correlation	1	.721**
	Sig. (2-tailed)		.000
	N	200	200
Attitude	Pearson Correlation	.721**	1
	Sig. (2-tailed)	.000	
	N	200	200

** . Correlation is significant at the 0.01 level (2-tailed).

From the above table (3) reveals that there is a significant positive correlation between awareness on OER and attitude towards OER in blended learning, as Pearson Correlation value is 0.721 and hence the null hypothesis “there is no statistically significant positive correlation between awareness on OER and attitude towards OER in blended learning” is rejected.

Findings of the study:

The following are the important findings of first vista of the study:

- ✦ The undergraduate learners have good level of awareness & attitude towards OERs, as mean value of awareness level of Open & regular HEIs learners is 37.54 & 37.20 and mean value of attitude level of Open & regular HEIs learners is 47.20 & 46.95.
- ✦ There is no significant mean difference in awareness on utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.
- ✦ There is no significant mean difference in attitude towards the utilization of OER in blended learning between undergraduate learners of regular and Open HEIs.
- ✦ There is a significant positive correlation between awareness on OER and attitude towards OER in blended learning.

Analyses pertaining to the objective of the second vista of the study:

To tap the key innovative ICT components that make OER more acceptable to learners/learners, the audit of ICT services gave some important insights about some ICT components that make online learning more acceptable.

The impact analyses were carried out by Centre for Internal Quality assurance, NSOU during the academic sessions 2019-2020 & 2020-2021. Interestingly, of the 5922 respondents (learners), 1469 were from 2019-2020 whilst 4453 in 2020-2021, reflecting the positive impact of ICT-enabled educational services and its growing acceptance along key components such as:

(Source: http://www.wbnsou.ac.in/about_us/CIQA/ict_audit_report/20211027_Report_ICT_Services_2020-21.pdf)

- ✦ Usage of Electronic Devices for accessing ICT services ranged from desktop to Mobile
- ✦ Learners’ received Course Materials from LMS/Website/NSOU-OER repository
- ✦ Online Services fulfilled learners’ expectations
- ✦ Suitability of Current schedules for online classes
- ✦ Online classes were preferred over Face-to Face classes in Learner Support Centres
- ✦ Easy Accessibility of online services
- ✦ Audio-Video lectures were helpful understanding concepts
- ✦ Learners accessed other resources and sites (MHRD- SWAYAM, NPTEL, e-PG pathshala, COL) through the links available on NSOU website
- ✦ Receiving quick response from the teacher during the online class
- ✦ Online classes of the university during COVID-19 helped learners to continue their study.

Interpretation:

To circumvent the difficulties arising out of the pandemic, NSOU has promptly initiated measures to digitise the SLM so that learners can have access to these from the university website. The university has put in place a system of online lectures to further augment this effort and complement its Face-to-face contact classes. The university proposes to strengthen these features in a progressive manner. The aim is to develop a system of online education to provide a new way of learning and develop learner’s mindset beyond the classroom. Once the technological and pedagogic challenges are properly addressed, online education will hopefully make

teaching and learning more interesting. The university has an eye on an effective blended/online learning package that is an amalgamation of e-text, audio and/or video material, graphics, simulation, animation, offline activities per se etc. This facility will be creative, collaborative and flexible.

Discussion:

This study indicated that the respondents have high level of awareness and positive attitude towards the utilization of OER in blended learning. This study also reflects that there is no significant mean difference in awareness & attitude towards the utilization of OER in blended learning between undergraduate learners of regular and open HIEs. Another study by Issa et al. (2020) found that undergraduates have a positive attitude towards the utilization of OER. This study also conforms with Swain and Panda (2009) which reflected that the benefits of e- resources have helped improve the attitude of users as it gives its user varied option that best suit each other. The result of the present study further confirms the earlier work of Ljubojevia, Vaskovic, Stankovic & Vaskovic (2014), found that learners are motivated to learn when they enroll in courses that make use of technology. Onaifo (2016) also reveal that although participants frequently used OER, their overall knowledge of the resources was limited and participants had a positive attitude towards OER and benefited from using the resources in multiple ways. Ivwighreghweta and Ambrose (2020) found that the learners have high level of awareness of the concept of Open Educational Resources. Itasanmi (2020) concluded that OER usage among learners is high. The high use of OER among the learners could be as result of the easy access to wide range of quality educational materials freely made available on the internet. A study conducted by the CIQA, NSOU as an audit of ICT services of the University among its learners on 1469 learners to assess the effectiveness of NSOU ICT services provided during the year 2019-2020, reflected that around 96% respondents have used smart phone while availing ICT services. But only 25% used e- SLMs and 45% of the respondents agreed on their ability to learn better on digital platform. Another online survey conducted by NSOU on 4453 learner during the year 2020-2021 found that 97% of respondents are using any kind of digital devices, 65% access academic materials through online mode, 57% prefer online classes over personal contact programme (face-to-face classes), 73% agree that online services are easily accessible (Source: http://www.wbnsou.ac.in/about_us/CIQA_ict_audit_report.shtml#active_ciqa_ict_audit_report). So based on the survey conducted by the CIQA, NSOU, it may be concluded that during the pandemic learners were more dependent on ICT resources as well as OER for their learning process than pre-pandemic times. So, there is a steady increase in the level of awareness and attitude towards utilization of OER which also reflected in the present study.

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