

IMPACT OF COVID-19 ON EDUCATION AND RESEARCH: A PERSPECTIVE OF SELECT STUDENTS AND RESEARCHERS IN INDIA

Dr Nadim Akhtar Khan
Senior Assistant Professor
Department of Library and Information Science
University of Kashmir
nadim@kashmiruniversity.ac.in

Mohd Ashraf Bhat
Research Scholar
Department of Library and Information Science
University of Delhi
owaisbhat331@gmail.com

Sabreena Saleem
Student
Department of Library and Information Science
University of Kashmir
sabu64840@gmail.com

ABSTRACT

The coronavirus, or COVID-19, outbreak greatly impacted all spheres of human life across the world, education and research institutions were no exception to this scenario. COVID-19 resulted in the closure of all significant activities globally, including educational and research activities. The present study attempts to explore the impact of COVID-19 on educational and research activities in India. The online survey method and responses were collected using a structured Google Forms questionnaire. The analysis is based on 251 responses from various higher education institutions, of which 174 respondents are students from higher education institutions and the rest, 77, are research scholars. The results reveal that most respondents agreed that COVID-19 greatly affected overall educational and research activities. The respondents also revealed that open education resources (OER) and libraries played an essential role during COVID-19, underscoring the importance of encouraging educators, researchers, and learners to espouse and brush up on their technological and digital skills.

Keywords: COVID-19, Higher Education, Research, OER, Libraries, Teaching-Learning, Online Education, Lockdown.

Introduction

The World Health Organization classified the coronavirus disease 2019 (COVID-19) as a global pandemic in early 2020 due to its outbreak (Park, 2020). This virus has a significant negative impact on all major activities carried out by social, economic, healthcare, transportation and other sectors, including the education and research sector. Because of the temporary closures caused by COVID-19, more than 370 million pupils could not attend the institutions, negatively exacerbating their situation (Zussman & Little, 2020).

Owing to the indefinite closing of educational establishments, including schools, colleges, and universities, following the COVID-19 epidemic, there has been an unprecedented shift towards the rapid adoption of online teaching and learning activities (Martinez, 2020). All significant activities were conducted online, including teaching, learning, research, and other interactions with students and researchers. Lederman (2020) rightly stated that COVID-19 forced students and teachers to adapt to the digital teaching-learning experience. They explored different digital platforms for effectively carrying out their teaching-learning activities, and such tools received considerable importance in addressing the significant challenges.

Libraries, like other essential service organisations, demonstrated their capacity amid this turbulence and were catering to the information needs of stakeholders by channelising the resources online (Ansari & PM, 2023). Therefore, libraries of all kinds have been working hard to provide remote access to collections and facilities around the globe by updating their websites and information systems. Digital or virtual library services were widely made available by these libraries to their users (Chakraborty & Jana, 2021). This scenario resulted in an enormous rise in the use of electronic resources and library websites (Shastri & Chudasma, 2021).

Besides, since the emergence of COVID-19, the International Federation of Library Associations and Institutions (IFLA) has been gathering data and resources about the activities and changing roles of libraries

worldwide and routinely updates the information accessible on its website, including COVID-19 news and resource websites (International Federation of Library Associations and Institutions [IFLA], n.d.).

Research institutions and groups worldwide were frantically trying to discover a cure as the COVID-19 pandemic spread, especially in poorer regions. Traditional methods of gathering data for research, including distributing physical questionnaires and conducting in-person interviews, were impractical because of the preventive measures, including social exclusion and lockdowns. Under these circumstances, the appropriate way for researchers to generate qualitative and quantitative data was by working remotely and using computer-mediated communication tools (Clay, 2020). Besides, online video conferencing interviews are one of the quickest and most reliable ways to collect qualitative data from respondents, just like a face-to-face interview (Nehls et al., 2015). Because human movement is restricted during pandemic outbreaks like the current COVID-19 to prevent the spread of infection, conventional research approaches are not feasible. Researchers are problem solvers trusted by international societies to constantly offer sound and valuable answers to societal ills like the current COVID-19 pandemic.

Review of Related Literature

The literature review thoroughly explores academic databases like Science Direct, Web of Science, Sage, Emerald Insight, and other academic social networking sites such as Academia.edu, ResearchGate, and Google Scholar. The literature review has been provided under the following headings for more clarity.

COVID-19 pandemic and Higher Education

Due to the rapidly spreading nature of the virus and the high rates of illness and mortality that it causes, COVID-19 has resulted in a severe global crisis (Tabish, 2020). COVID-19 has affected people's lives and the global economy, causing substantial upheaval in the educational systems of both developed and developing countries (Xiang et al., 2020). The epidemic significantly impacted tertiary students' academic activities as they were worried about their future education, professions and social lives (Cao et al., 2020). The International Association of Universities (IAU), in one of the recently conducted surveys of higher education institutions across the globe, revealed that more than 90% of the institutions had switched from classroom instruction to remote instruction or were in the process of doing so (Marinoni et al., 2020). The sudden switch to online learning without any preparation puts the majority of students at risk of developing into passive learners with short attention spans, especially in nations like India where the curriculum was not designed for such a format and the foundation for online learning was not yet ready (Srivastava et al., 2020). The significant challenges stakeholders face are mental distress, physical immobility, financial crunches and technological concerns (Kalia et al., 2023) .

The closure of schools, training centres, and higher education institutions during the pandemic resulted in a paradigm shift to online learning as educators started to provide high-quality instruction through numerous online venues. The school system and educators have adopted "Education in Emergency" through several internet platforms and were compelled to accept a system for which they are unprepared (Pokhrel & Chhetri, 2021). E-learning platforms were crucial in helping schools and universities throughout the epidemic to support student learning (Subedi et al., 2020). Students with physical disabilities also benefited from online learning because the classes were conducted virtually in an immobile environment (Basilaia & Kvavadze, 2020) .

Teachers also created educational classrooms, training sessions, and skill development programs using unified collaboration and communication tools like Google Classroom, Microsoft Teams, Blackboard and Canvas (Petrie, 2020). Due to the abundance of platforms and online educational resources, instructors and students frequently encounter issues when using or referring to them. Teachers actively worked together to create various online teaching strategies. Due to the shared experiences of teachers, parents, and kids, there is an unmatched opportunity for cooperation, original thinking, and a willingness to experiment with new ideas (Doucet et al., 2020).

Role of Open Educational Resources (OER) during covid-19

The sudden shift to online education during the COVID-19 pandemic significantly boosted demand for more readily available online information sources (Schafhauser, 2020). During this global crisis, educators readily adapted OER to expand student access to learning resources and remix the materials to maximise student learning and engagement opportunities (Van et al., 2020). Using the right educational technology to meet the needs of a diverse range of students improves access to learning tactics like Massive Open Online Courses (MOOCs) and various learning approaches (Onyema et al., 2019). According to research, OER are precisely as effective as conventional or commercial textbooks and materials, and teachers and instructors like them (Delgado et al., 2019; Grissett & Huffman, 2019; Hilton, 2016; John, 2020; Shams et al., 2020;). The Ministry

of Human Resources Development (MHRD) and the University Grants Commission (UGC) made numerous arrangements, including the launch of numerous virtual platforms with online depositories, e-books, and other online teaching and learning materials, educational channels via Direct TV and Radio for students to continue their education, and online meetings between faculty members and students (Jena, 2020) . Libraries across the globe also stepped in and utilised their ability to gather, evaluate, and provide organised access to OER through their websites (Ladan et al., 2020). These libraries also responded to this online shift by enabling access to e-resources and databases to enrich online learning environments and research activities (Nagarkar, 2020). OER thus provides a lasting solution to ensure fair, inclusive access to quality learning experiences and educational resources even during crises (Cable & Vézina, 2020).’

Problem

The pandemic has caused an unprecedented socioeconomic crisis that has affected every aspect of human life, including the education sector, which was greatly affected by the closure of educational establishments and the instant shift to online learning. The present study explores the effects of COVID-19 on education and research in general and its impact on teaching, learning, and research activities in particular through abrupt shifting to the online mode. The study further reveals the ways and means adopted by the stakeholders to address the unprecedented challenges posed by COVID-19. The study is confined to the perceptions of selected students and scholars currently enrolled in different universities and colleges for higher education and research programs.

Objectives

1. To analyse the impact of COVID-19 on education and research.
2. To reveal the stakeholders' perceptions regarding the abrupt shift towards online learning and research activities.
3. To analyse the role of OER in higher education during covid-19.
4. To trace the emerging approaches and strategies adopted for overcoming the challenges associated with online teaching and learning during COVID-19.

Methodology

An online survey using a structured questionnaire was adopted for the study. The questionnaire was designed as a data collection tool in Google Forms due to its ease and accuracy in data collection. The questionnaire was distributed among online student and research scholar groups and forums on various social networks identified as alternative modes for channelling and distributing questionnaires. The data is represented in tabular form for drawing meaningful inferences and conclusions regarding the laid-out objectives and suggesting recommendations to further enrich online education and research activities to cater to the evolving online educational requirements and skills.

Data Analysis

Distribution of respondent Gender wise and education level-wise

The analysis is based on 251 responses from various higher education institutions. Out of 251 responses, 50% of respondents were from each gender, i.e., 127 were males and 124 were females. The educational qualifications of the respondents are as follows: 174 participants (69.32%) are post-graduate students, and the rest, 77 (30.68%), are research scholars (Table 1).

Table 1. Distribution of respondent Gender wise and education level-wise
N=251

Gender	Number of Respondents	Respondent types	Number of Respondents
Males	127(50.60)	Post-Graduate students	174(69.32)
Females	124(49.40)	Researchers	77(30.68)
Total	251(100)	Total	251(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Impact of COVID-19 on Educational Institutions and the Switch to Online Mode

Almost all educational institutions have been affected by the COVID-19 outbreak, as out of 251 responses, 214 respondents (85.25%) responded yes, followed by 24 (9.56%) for no, then 10 (3.99%) were uncertain, and lastly, only 3 respondents (1.20%) preferred not to answer. The data also reveals that almost all the educational institutions have switched to an online mode to continue the process of teaching and learning during the pandemic, as out of 251 responses, 233 respondents (92.83%) have answered "yes" regarding the adoption of an online mode of education, followed by 16 (6.37%) answering "no" in this regard, with only 2 (0.8%) blank responses (Table 2).

Table 2. Impact of COVID-19 and Switching to online mode
N=251

Responses	Impacted by COVID-19	Switch to Online mode
	Number of Respondents	Number of Respondents
Yes	214(85.25)	233(92.83)
No	24(9.56)	16(6.37)
Uncertain	10(3.99)	0(0)
Blank	3(1.20)	2(0.80)
Total	251(100)	251(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Modes of the Teaching-Learning Process

As a remedial measure for continuing the teaching-learning process during the pandemic period, most educational institutions have adopted the online mode of education with real-time video conferencing, as out of 251 responses, 161 (64.14%) considering real-time video conferencing, followed by online presentations of 27 (10.76%), 23 (9.17%) for online mode but not in real-time, then 18 (7.17%) for online mode of education with audio recording, and finally, 7 (2.79%) for other modes and 15 (5.98%) preferred not to answer (table 3).

Table 3. Preferred online modes adopted for Teaching and Learning

N=251

Preferred online modes adopted for Teaching and Learning	Number of Respondents
Online in real-time (Video Conference)	161(64.14)
Online Presentations	27(10.76)
Online not in real time (Video Recordings)	23(9.17)
Online with Audio Recordings	18(7.17)
Others	7(2.79)
Blank	15(5.98)
Total	251(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Familiarity with OER and use of prominent OER platforms

OER are freely accessible and openly licenced resources that anyone can access anytime. However, unfortunately, a good number of people are unaware of these resources, as we have observed that out of a total of 251 respondents, 165 respondents (65.73%) are aware of these resources. In comparison, 72 respondents (28.69%) are unaware of them, and the rest 14 responses (5.58%) were left unanswered. Due to this scenario, a fair number of people cannot access and use them. The student community used various OER platforms like YouTube, Egyankosh, e-PG Patshala, Byjus, Massive Open Online Courses, Open Learn, etc. The data reveals that almost all the respondents used YouTube during these times to continue their educational activities, as the maximum number of respondents, 214 (85.25%), were using YouTube. This was followed by Khan Academy and MOOCs with the same respondents, i.e., 35 (13.94%) for each, followed by e-PG Pathshala and OpenLearn with 29(11.55%) respondents each, followed by Egyankosh with 19 (7.56%) respondents and Others 25(9.96%) used OER available through others sources like Google, Wikipedia, teacher's content, etc. (Table 4).

Table 4. Familiarity with OER and Use of Prominent OER platforms

N=257

Familiarity with OER	Number of Respondents	Platforms	Number of Respondents
Yes	165(65.73)	YouTube	214(85.25)
No	72(28.69)	Khan Academy	35(13.94)
Blank	14(5.58)	MOOCs	35(13.94)
Total	251(100)	e-PG Pathshala	29(11.55)
		OpenLearn	29(11.55)
		E-Gyankosh	19(7.56)
		Others	25(9.96)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Impact of Covid-19 on Research

COVID-19 greatly impacted the research, as can be observed from the responses of 77 respondents: out of which 60(77.92%) respondents ultimately agreed that the pandemic greatly impacted their research work, and only 10(12.99%) respondents disagreed with the statement. The remaining 7(9.09%) respondents were neutral, i.e., they didn't observe the significant impact of the pandemic on their research work, as shown in Table 5.

Table 5. Impact of COVID-19 on Research

N=77

Responses	Impact of COVID-19 on Research
	Number of Respondents
Agree	60(77.92)
Disagree	10(12.99)
Neutral	7(9.09)
Total	77(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Level of Impact on Research Activities

Most of the researchers were significantly impacted by COVID-19 as out of 77 responses, 37(48.05%) respondents agreed that research activities were completely halted during COVID times. In contrast, only 18(23.38%) revealed that the pandemic created a sense of uncertainty among them about their research activities. Another 18 (23.38%) respondents experienced a less significant impact on their research activities, and the remaining 4 (5.19%) preferred not to answer the question, as shown in Table 6.

Table 6. Level of Impact on Research Activities

N=77

Level of Impact on Research	Number of Respondents
Completely Halted my research activities	37(48.05)
Resulted in uncertainty regarding my research activities	18(23.38)
Had less impact on my research work	18(23.38)
No-response/Blank	4(5.19)
Total	77(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Contact of Researchers with their Supervisors during the Pandemic Period

More than half of the respondents, i.e., 51 (66.23%), revealed that they were in partial contact with their supervisors, whereas only 12(15.58%) respondents had Face-to-face contact with their research supervisors. The other 12 (15.58%) respondents were not in any contact with their research guides, and the remaining 2(2.60%) respondents preferred not to answer (Table 7).

Table 7. Contact status with Supervisors

N=77

Contact Status	Number of Respondents
Partial Contact	51(66.23)
Face-to-face contact	12(15.58)
No Contact	12(15.58)
No answer	2(2.60)
Total	77(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Availability of OER through Libraries during the Pandemic Period

Table 8 reveals that out of 77 respondents, 22 (28.57%) agreed that OER were accessible to them through their institutional libraries, whereas 26 (33.77%) partially agreed with the same statement, and

26 (33.77%) respondents disagreed. The remaining 3(3.89%) respondents preferred not to respond.

Table 8. Availability of University Library Resources

N=77

Responses	Number of Respondents
Agree	22 (28.57)
Partially Agreed	26(33.77)
Disagree	26(33.77)
Blank	3(3.89)
Total	77(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

The researcher's enthusiasm towards research work during the Covid epoch

The passion or enthusiasm for learning among the students decreased during Covid times. Similarly, the passion of the research scholars for the research work also decreased to a greater extent. Table 9 shows that 45 participants (58.44%) agreed that their overall passion for research decreased, 18 participants (23.38%) agreed that their overall passion for research increased, whereas 11 participants (14.29%) agreed that their passion remained constant, and 3 participants (3.39) preferred not to respond.

Table 9. The researcher's enthusiasm towards research work during the Covid epoch

N=77

Responses	Number of Respondents
Decreases	45 (58.44)
Increases	18(23.88)
constant	11(14.29)
Blank	3(3.39)
Total	77(100)

Source: Primary Data

Note: Figures in the parentheses indicate the Percentage

Findings and Conclusion

The current study reveals that the COVID-19 pandemic enormously impacted most participants' academic performance. More than 85% of the respondents believe that the COVID-19 outbreak has impacted their educational activities to a greater extent due to the cancellation of their offline classwork. Consequently, they shifted from the traditional learning mode to an online mode. More than 63% of the respondents agreed that they consulted various online teaching and learning resources, including OER, by accessing OER repositories like YouTube, e-PG Pathshala, Egyankosh, Khan Academy, MOOCs, etc. Still, many respondents could not harness the benefits of OER due to their ignorance about these resources.

As far as results are concerned, it was found that more than 77% of the research scholars ascertained that the pandemic significantly impacted the research activities. Several challenges were faced by the research scholars during these difficult times, such as stress and uncertainty, less access to library resources, problems in the compilation and drafting of theses, and very few face-to-face interactions with the guide(s). As a result of which, the researchers felt heavy workloads during these times. More than 66% of the respondents ascertained that they were having partial contact with their supervisors and the persons who were essential for their research work, thereby hampering the smooth conduct of their research.

The findings also reveal that more than 85% of the participant community agreed with the statement that the COVID-19 pandemic affected overall educational and research activities all across the country.

The epidemic allowed pedagogical techniques to evolve and for virtual education to be implemented at all levels of education. Online education helps students stay on track since it lets them learn at their own pace. The librarians employed a range of tactics to address the issue, including relying on empowerment initiatives (like information and media literacy), giving users access to reliable information, helping with research and collection development, promoting awareness, and using a variety of tools to assess information. Librarians should

function as catalysts for effectively disseminating information to promote proper knowledge. OER proved essential in these widespread crises for giving students more access to educational resources and customising or remixing those materials to increase student involvement and learning opportunities. This online transition would have been more challenging without digital tools, which have facilitated access to a wealth of academic and pedagogical knowledge resources. The COVID-19 outbreak has shown the value of preparing teachers and students to use these online educational tools and technologies. Teachers and students should be encouraged to continue utilising online technologies to enhance their teaching and learning activities and catch up with different advancements for brushing their skills and staying relevant to address various evolving challenges.

References

- Ansari, A. J., & PM, N. A. (2023). Usage of digital library services during COVID-19 pandemic: a study of Indian Institutes of Management (IIMs). *Digital Library Perspectives*. <https://doi.org/10.1108/DLP-10-2022-0083>
- Basilaia, G., & Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (COVID-19) pandemic in Georgia. *Pedagogical Research*, 5(4). <https://doi.org/10.29333/pr/7937>.
- Cable, G. & Vézina, B.(2020,March 31). Education in times of crisis and beyond: maximizing copyright flexibilities. Education/OER.<https://creativecommons.org/2020/03/31/education-in-times-of-crisis-and-beyond-maximizing-copyright-flexibilities/>
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The Psychological Impact of the COVID-19 Epidemic on College Students in China. *Psychiatry Research*, 287.<https://doi.org/10.1016/j.psychres.2020.112934>.
- Chakraborty, S. and Jana, S. (2021), “Challenges and opportunities of academic libraries in India because of COVID-19”, *Annals of Library and Information Studies*, Vol. 68 No. 2, pp. 110-118.
- Clay, R. A. (2020). Conducting Research during the COVID-19 Pandemic. <https://www.apa.org/news/apa/2020/conducting-research-covid-19>.
- Delgado, H., Delgado, M., & Hilton III, J. (2019). On the efficacy of open educational resources: Parametric and nonparametric analyses of a university calculus class. *International Review of Research in Open and Distributed Learning*, 20(1). <https://doi.org/10.19173/irrodl.v20i1.3892>.
- Doucet, A., Netolicky, D., Timmers, K., & Tuscano, F. J. (2020). Thinking about pedagogy in an unfolding pandemic: an independent report on approaches to distance learning during COVID-19 school closures. *Education International*. https://issuu.com/educationinternational/docs/2020_research_covid-19_eng.
- Grissett, J. O., & Huffman, C. (2019). An open versus traditional psychology textbook: Student performance, perceptions, and use. *Psychology Learning & Teaching*, 18(1), 21-35. <https://doi.org/10.1177/1475725718810181>.
- Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational technology research and development*, 64(4), 573-590. <https://doi.org/10.1007/s11423-016-9434-9>.
- International Federation of Library Associations and Institutions [IFLA].(n.d.).*COVID-19 and the Global Library Field*.Retrieved from <https://www.ifla.org/covid-19-and-the-global-library-field/>
- Jena, P. k., (2020). Impact of pandemic COVID-19 on education in India. *International Journal of Current Research*. Vol 12, Issue 07, pp1258212586. <https://doi.org/10.24941/ijcr.39209.07.2020>.
- John III, H. (2020). Open educational resources, student efficacy, and user perceptions: a synthesis of research published between 2015 and 2018. *Educational Technology, Research, and Development*, 68(3), 853-876. <https://doi.org/10.1007/s11423-019-09700-4>.
- Kalia, P., Behal, B., Kaur, K., & Mehta, D. (2023). Impact of COVID-19 on education in India: stakeholders' voice. *Benchmarking*. <https://doi.org/10.1108/BIJ-11-2021-0665>
- Ladan, A., Haruna, B., & Madu, A. U. (2020). COVID-19 pandemic and social media news in Nigeria: The role of libraries and library associations in information dissemination. *International Journal of Innovation and Research in Educational Sciences*, 7(2), 2349-5219.
- Lederman, D. (2020, March 17). Will shift to remote teaching be boon or bane for inline learning? *Inside Higher Education*. <https://www.insidehighered.com/digital-learning/article/2020/03/18/most-teaching-going-remote-will-help-or-hurt-online-learning>
- Marinoni, G., Van't Land, H., & Jensen, T. (2020). The impact of Covid-19 on higher education around the world. IAU global survey report, 23, 1-17.
- Martinez, J. (2020). Take this pandemic moment to improve education. *Edu Source*. <https://edsources.org/2020/take-this-pandemic-moment-to-improveeducation/> 633500
- Nagarkar, S. (2020). COVID-19: the role of a library during a pandemic. *Sakal Times*. <https://www.sakaltimes.com/opinionnation/covid-19-role-library-during-pandemic49537>.

- Nehls, K., Smith, B. D., & Schneider, H. A. (2015). Video-Conferencing Interviews in Qualitative Research. In S. Hai-Jew (Ed.), *Enhancing Qualitative and Mixed Methods Research with Technology* (pp. 140-157). IGI Global. <https://doi.org/10.4018/978-1-4666-6493-7.ch006>
- Onyema, E.M., Deborah, E. C., Alsayed, A. O., Noorulhasan, Q., & Sanober, S. (2019). Online Discussion Forum as a Tool for Interactive Learning and Communication. *International Journal of Recent Technology and Engineering*, 8(4), 4852–4859. <https://doi.org/10.35940/ijrte.d8062.118419>.
- Park, S. E. (2020). Epidemiology, virology, and clinical features of severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2; Coronavirus Disease-19). *Clinical and experimental pediatrics*, 63(4), 119-124. doi:10.3345/cep.2020.00493
- Petrie, C. (2020). Current opportunities and challenges on Covid-19 in education. Spotlight: Quality education for all during Covid-19 crisis. <https://hundred.org/en/collections/quality-education-for-all- during-coronavirus>.
- Pokhrel, S., & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future*, 8(1), 133-141. <https://doi.org/10.1177/2347631120983481>
- Schaffhauser, D. (2020). Updated: Free resources for schools during COVID-19 outbreak. *The Journal*, 13. <https://thejournal.com/articles/2020/03/13/free-resources-ed-tech-companies-step-up-during-coronavirus-outbreak.aspx>.
- Shams, S., Haq, M. A. U., & Waqar, Y. (2020). Open educational resources (OER) usage trends among university students of Pakistan. *Education and Information Technologies*, 25, 5637-5654. <https://doi.org/10.1007/s10639-020-10195-3>.
- Shastri, D. K., & Chudasma, P. (2022). The perception of ICT skills and challenges of usage of technologies among the library professionals of the Gujarat State during the COVID 19: a comprehensive study. *Quality & Quantity*, 56(3), 1093-1120. <https://doi.org/10.1007/s11135-021-01167-x>
- Srivastava, S., Singh, P., & Singh, V. P. (2020). Impact of COVID-19 on education system in India: A review. *IRE Journals*, 4(1), 1-7. <https://www.irejournals.com/formatedpaper/1702399.pdf>
- Subedi, S., Nayaju, S., Subedi, S., Shah, S. K., & Shah, J. M. (2020). Impact of E-learning during COVID-19 pandemic among nursing students and teachers of Nepal. *International Journal of Science and Healthcare Research*, 5(3), 68-76. Retrieved from <https://www.academia.edu/download/64126179/IJSHR0012.pdf>
- Tabish, S. A. (2020). COVID-19 pandemic: Emerging perspectives and future trends. *Journal of public health research*, 9(1). <https://doi.org/10.4081/jphr.2020.1786>, 1786-1786.
- Van Allen, J., & Katz, S. (2020). Teaching with OER during pandemics and beyond. *Journal for Multicultural Education*, 14(3/4), 209-218. <https://doi.org/10.1108/JME-04-2020-0027>
- Xiang, Y. T., Li, W., Zhang, Q., Jin, Y., Rao, W. W., Zeng, L. N., & Hall, B. J. (2020). Timely research papers about COVID-19 in China. *Lancet*, 395(10225), 684-5. [https://doi.org/10.1016/S0140-6736\(20\)3037](https://doi.org/10.1016/S0140-6736(20)3037)
- Zussman, R., & Little, S. (2020, March 18). *BC suspends K-12 classes indefinitely amid coronavirus pandemic*. Global News. <https://globalnews.ca/news/6689354/john-horgan-cabinetministers-announce-measures-slow-spread-coronavirus>.