Research Article

A Tale of Two Cities: Exploring Factors Affecting Online Learning Equity

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Abstract

The Covid pandemic has caused a significant shift in the education sector, pushing for rapid integration of technology in education worldwide. This has resulted in a move from traditional classroom learning to online and blended modes of learning, which is likely to continue. Though access to technology is crucial for driving innovation and equity in education, regional disparities have been widely pervasive, affecting overall educational governance at national, regional, and local levels. This paper delves into the problem of equity in online learning in Delhi and Varanasi, with a total of 2,563 responses and data analysis based on regression charts identifying key trends and patterns affecting equity in learning. Our findings show that students enrolled in private schools had better access to online education in both cities. The study also revealed the significance of cultural inclusivity in online learning. The diversity of students' cultural backgrounds affects the process and outcomes of online learning. The findings from this research can serve as valuable guidance to enhance pedagogical designs that adapt better to online learning practices for school students during the COVID-19 pandemic or any future unexpected crises. We provide recommendations for policymakers and educators to promote inclusivity in online education.

Keywords – learning equity, online education, Delhi, Varanasi, COVID-19, digital divide, educational policy, cultural inclusivity.

Introduction

Online Learning in School Education: Emergence and Equity Challenges

In recent years, online learning has burgeoned as a central component of primary education worldwide, primarily facilitated by its ability to grant unrestricted access to educational content and instructions, irrespective of time and geographical limitations (Ali et al., 2020). 'Online learning', deciphered as the usage of technology in education evolved and led to the creation of new challenges and opportunities during Covid-19 (Kidd and Murray, 2020). It encompasses remote learning, distance learning as well as e-learning (Singh and Thurman, 2019; Shahzad et al., 2021). Well-built online learning programmes can impart qualitative, affordable, flexible and equitable access to education (Castro and Tumibay, 2021; Dhawan, 2020).

Technology has fundamentally altered the landscape of learning by facilitating interactive and immersive experiences that foster both engagement and effective outcomes. However, attaining global equity in online learning is a complex endeavour, with empirical studies underscoring a gamut of factors influencing its efficacy. A primary concern is students' satisfaction, perceived effectiveness, and preferences regarding online learning platforms, which have been found to be intricately tied to familial, school, and individual factors, hence necessitating these factors' integration in strategies to augment the online learning experience for primary school students (Zheng et al., 2022).

ICT literacy emerges as another significant factor, notably in regions grappling with limited technological access, posing barriers to the holistic development of students' digital skills. Teachers' proficiency in computer usage and the tangible accessibility to technological tools are critical aspects to be addressed (Alshmrany & Wilkinson, 2017; Mogwe & Balotlegi, 2020). Professional development programs aimed at bolstering teachers' computer literacy and strategic partnerships to augment ICT infrastructure in schools could serve as potential countermeasures.

Cultural responsiveness is vital to ensuring inclusivity, negating the possible dominance of Western educational paradigms, and embracing the diversity of students' cultural backgrounds globally (Smith & Ayers, 2006). In parallel, understanding and addressing the determinants influencing parental choices and intentions towards online learning is pivotal. Some of the most frequently used technologies during COVID 19 for online learning were Zoom, private learning management systems (Turnbull et al., 2021), social media (Kara et al., 2020; Bordoloi et al., 2021) etc. Concerns have also been raised about the compromised quality of online learning as compared to traditional classroom teaching (Palvia et al., 2018; Korkmaz and Toraman, 2020) due to lack of academic rigour, passiveness and disengagement (Coman et al., 2020; Ferri et al., 2022; Duki'c and Krzic, 2022).

Most importantly, the digital divide due to lack of device or internet access, especially in the Global South (Ghazi-Saidi et al., 2020; Ndzinisa and Dlamini, 2022), as well as gender disparity in access to online education (Shahzad et al., 2021) has been found to be pervasive. Despite the challenges, the transition to online learning during Covid led to nouvelle learning opportunities, experimentation, and an overall boost to digital infrastructure worldwide (Almarzooq et al., 2020; Greenhaw et al., 2022) The pandemic also provided the opportunity globally to experiment with rapid innovations and trials with technology to facilitate access to remote

learning (UNESCO, 2020; UNICEF, 2020). However, different research findings before 2020 had reflected only moderate learning gains through digital learning techniques; and may be considered as a supplement rather than substitution to imparting education and learning (Allen et al., 2004; US DoE, 2010; EEF., 2019). In the context of developing countries, Muralidharan et al. (2019) find that well-designed learning programmes utilizing technology as a learning aid bring favourable outcomes.

The rapid shift to online learning has highlighted equity challenges, particularly in regions with diverse socio-economic backgrounds such as Delhi and Varanasi. This study aims to explore these challenges further, focusing on the impact of factors such as technological access, digital literacy, and cultural inclusivity on learning equity during the COVID-19 pandemic.

Regional insight – Delhi and Varanasi

In Delhi, one of India's largest metropolitan cities with a significant young population (Census of India, 2011), the literacy rate among students is a remarkable 86.2%, far exceeding the national average of 25 per cent (Economic Survey of Delhi, 2020). This reflects the city's robust education system and its successful integration of technology into educational practices, especially critical during the COVID-19 pandemic (Hindu, 2021; Dayal 2023).

Contrastingly, Varanasi, an ancient city and a significant cultural center, faces distinct educational challenges. With a population of over 3.6 million, Varanasi grapples with limited internet access and a noticeable disparity in digital literacy, issues that are particularly acute in its surrounding rural areas (ISP News, n.d.). The economic impact of the pandemic has further exacerbated these challenges, hindering the accessibility of digital devices necessary for online education (Singh 2020).

This juxtaposition of Delhi's progressive educational environment against Varanasi's struggle with technological integration underlines the digital divide in India. Despite national efforts like the PM e-Vidya and Diksha programs aimed at enhancing digital literacy (Department of School Education & Literacy, n.d.), the pandemic has laid bare the necessity for more targeted support and resources, especially in areas like Varanasi where barriers to online learning remain significant (Bailey, 2020).

In the next sections, we present the methods and results of our study which aims to uncover the key factors impacting online learning equity in Delhi and Varanasi. Our analysis seeks to contribute valuable insights to the discourse on online learning and offer evidence-based recommendations for enhancing equity and inclusivity in online education.

Methodology

Research funded by Anglia Ruskin University's 'Global Challenges Research Fund' in collaboration with, Banaras Hindu University (BHU), Jamila Millia Islamia University1 (JMI) and the National Institute of Educational Planning and Administration (NIEPA) looked at gendered impacts on access to education and technology during COVID-19 in India. The study rooted itself in the horizon of inequalities within the supply of education, which has been further widened following the pandemic due to a sudden need to transition towards face-to-face to online learning. The present study undertakes quantitative research design to study the inequity in access to education and technology between and within two populous cities e.g., in Delhi and Varanasi, which come under different categories. As of 2023, Delhi is an X-Class, which comes under tier 1, whereas Varanasi is a Y-Class which comes under a tier 2 city 2. Both cities present

unique characteristics, contributing to a comprehensive understanding of the challenges and opportunities for online learning equity.

Sample

The data in the present study was collected from 2,554 students from both Delhi and Varanasi. A random sampling approach was used to select the schools under study. This was done using the UDISE data, from where a total of 105 schools were filtered for Varanasi and 45 for Delhi. The final appointment of schools from both regions was made by the principals' confirmation. Within these schools, a convenient sampling method was appointed for the data from students who studied in classes 6-12th.

The demarcation of data includes 1389 student respondents from Delhi who studied in ten schools in Delhi from both the Southeast and Southwest regions within the capital. From Varanasi, 1165 student respondents participated from six schools in the region. The students in the present study belonged to both government, government-aided and private schools, which were co-educational and senior secondary by nature. Most of the students in the present study belonged to schools in urban locations while only a few belonged to schools in a rural region. With respect to gender, 1510 were males while 1022 were female students in the study. Region-wise data of the students on school type, location type and gender can be further seen in Table 1.

Table-1: Demographic Profile of the Respondents

Demographic Category	Sub-Category	City	n	%
School Type	Government Schools	Delhi	338	13.2
		Varanasi	678	26.5
	Government Aided Schools	Delhi	618	24.1
		Varanasi	65	2.5
	Private Schools	Delhi	430	16.8
		Varanasi	416	16.3
	Missing Data	Delhi	9	0.4
		Varanasi	6	0.2
Location Type	Urban	Delhi	1290	50.4
		Varanasi	1165	45.5
	Semi-Urban	Delhi	28	1.1
		Varanasi	0	0
	Rural	Delhi	50	2.0
		Varanasi	0	0
	Missing	Delhi	27	1.1
		Varanasi	0	0

Gender	Male	Delhi	824	32.5
		Varanasi	686	27.1
	Female	Delhi	558	22.0
		Varanasi	464	18.3
	Others	Delhi	2	0.1
		Varanasi	0	0.0

Data Collection and Tool Development

A structured survey was conducted on students to gather insights into their experiences, perceptions, and challenges related to online learning. The survey questionnaire was designed to capture the inequity in access to education and technology, with respect to online classes on six parameters such as access to online classes, access to digital infrastructure for online learning, student's digital preparedness, access to the conducive learning environment at home, institutional support, stress and well-being and academic self-efficacy. These items were tapped analytically through a self-composed scale, which incorporated 20 items which were answered by the students along with the questions on demographic features. The reliability of the scale conceptualized in the study has a Cronbach Alpha value of 0.91, which makes it a reliable and valid measure.

Data Analysis

The collected data were subjected to a rigorous analysis. Since the data from the survey aimed to explore the factors affecting learning equities, regression analysis was performed as a multivariate method of analysis to locate the primary interplay of the variables undertaken. According to Ter Braak & Looman (1995), regression as a statistical method can be effectively used in investigating the relationship between variables a functional measure to identify the interplay of variables in a causal way, which successfully predicts the responses without great error. Regression Analysis for the present study was performed on Jamovi Software (Version 2.3), which used the R core team package for its statistical computing. This approach enabled the identification of key trends and patterns, as well as the emergence of critical factors affecting online learning equity. Comparative analysis between the regions were analysed similarly.

Findings and Discussion

Delhi (n=1389)

Results from the regression analysis of data from Delhi obtained that school type was a single factor contributor to the overall variability in students' access to online learning and education with a significant p-value of less than 0.001. It varied the score to upto 17.4 per cent (Table 2), where students from private schools were found to have better access to online learning and education (Table 3).

Table-2 : Regression Model Fit Measures

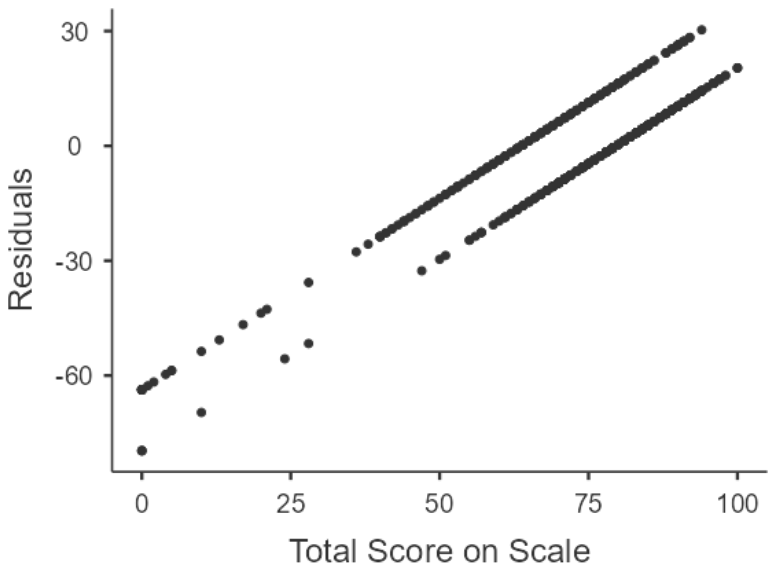
Model	R	R^2	Adjusted R^2
1	0.419	0.175	0.174

Table-3:Model Coefficients on the Total Score on Scale of "Online Learning Equity"

Predictor	Estimate	SE	t	p
Intercept	63.7	1.05	60.6	< .001
School Type:				
Private – Public	15.9	1.32	12.0	< .001

Represents reference level

Figure-1: Residual Plot of the Regression Model



Note. Figure 1 shows that there is a positive relationship between school type and learning equity of the students, such that students from private schools have better access to online learning and education.

Varanasi (n=1165)

Regression analysis on the data from UP found that 7.1 per cent variation in learning access was found (Table 4) for two predictor variables, such as school type and gender. It can be seen from Table 5 that with respect to school type, students who belonged to private schools had greater learning equity than those from government schools. In terms of gender, female students were found to have better access to online learning, education, and technology as compared to male students.

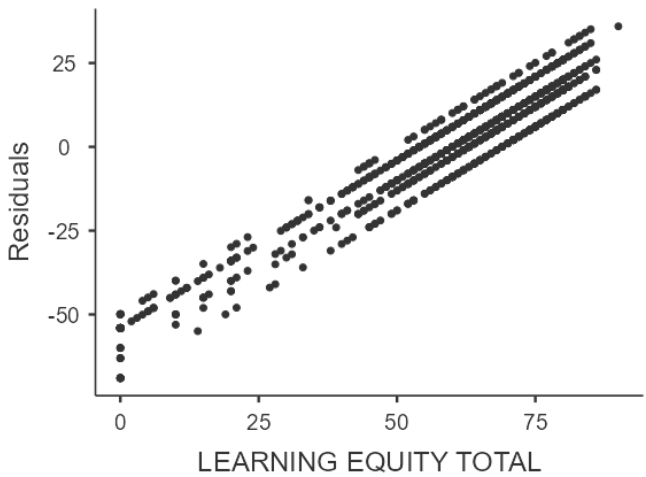
Table-4:Regression Model Fit Measures

Model	R	R^2	Adjusted R^2
1	0.271	0.0736	0.0712

Table-5:Model Coefficients on the Total Score on Scale-"Online Learning Equity"

Predictor	Estimate	SE	t	p
Intercept	54.06	0.931	58.04	< .001
School Type:				
Govt. Aided – Govt.	-4.14	2.698	-1.53	0.125
Private-Govt.	8.99	1.257	7.15	< .001
GENDER:				
Female-Male	5.93	1.234	4.80	< .001

Figure-2: Residual Plot of the Regression Model



Note. The figure shows a strong relationship between school type, gender and learning equity, such that female students and those belonging to private schools had greater learning equity.

Compiled Data from Delhi and Varanasi

Results from the regression analysis of the complete data represented up to 18 per centvariation (Table 6 see below) in the results with respect to the school type, annual income and region type on access to online learning. It can be seen from Table 7 that in terms of school type, students from private schools had more access to education and technology for online classes as compared to those studying in government schools. It was also obtained from the analysis that students whose families belonged to upper-income groups had greater access to online education and learning. The results found a stark contrast between those whose monthly income was less than five thousand Indian rupees and those earning up to eighty thousand and above monthly. With respect to the region type, students from Delhi were found to have greater learning equity than students from Varanasi. The results were significant on a 0.001 level of significance.

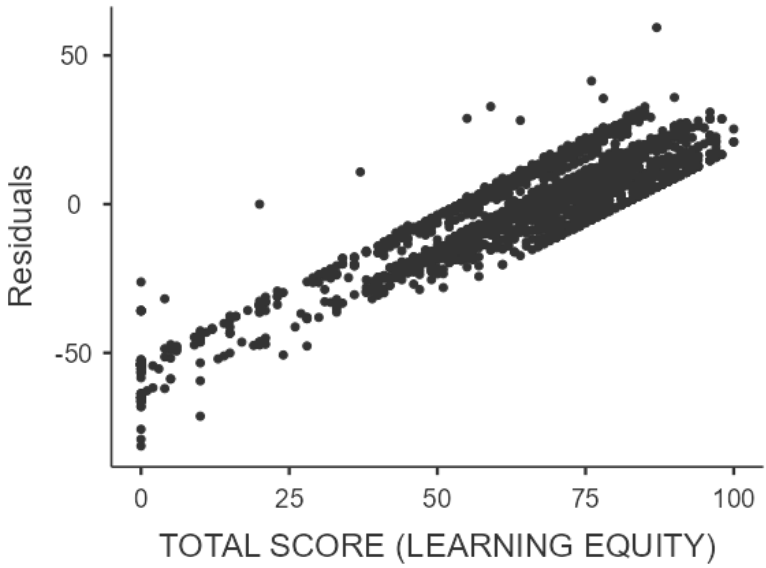
Table-6:Regression Model Fit Measures

Model	R	R^2	Adjusted R^2
1	0.429	0.184	0.180

Table-7: Model Coefficients on the Total Score on Scale-"Online Learning Equity"

Predictor	Estimate	SE	t	p
Intercept [a]	63.380	1.410	44.955	< .001
SCHOOL TYPE:				
Govt Aided-Govt.	-1.497	1.551	-0.965	0.335
Private – Govt	9.698	0.988	9.812	< .001
MONTHLY INCOME:				
(5K-10K) – Below 5K	0.499	1.377	0.362	0.717
(10-20K) – Below 5K	2.856	1.462	1.954	0.051
(20-40K) – Below 5K	3.321	1.583	2.098	0.036
(40-60K) – Below 5K	4.948	1.704	2.905	0.004
(60-80K) – Below 5K	6.177	1.897	3.257	0.001
Above 80K – Below 5K	8.389	1.732	4.844	< .001
REGION TYPE:				
Varanasi- Delhi	-10.276	0.835	-12.310	<.001

Figure-3: Residual Plot of the Regression Model



Note. Figure 3 shows a strong relationship between the school type, monthly income, region type and learning equity, such that students from the private schools and greater monthly household income and those from Delhi schools had greater learning equity.

Table-8: Summary of Factors Affecting the Online Learning Equity

Data Type	Factor Affecting	Predictors for Better Online Learning Equity
Delhi	School Type	Students studying in private schools had greater online learning equity.
Varanasi	School Type	Students studying in private schools had greater online learning equity.
	Gender	Female students had more online learning equity than male students.
Total Data Compiled	School Type	Students studying in private schools had greater online learning equity.
	Monthly Income	Students with monthly income greater than five thousand a month had better online learning equity
	Region Type	Students from Delhi were found to have greater learning equity than students from Varanasi.

Conclusion

The impact of the COVID-19 pandemic on education has been especially severe in India, and the pandemic has exposed existing fault lines in the education system and exacerbated greater learning inequalities. The government responses in these two cities have been different in Varanasi and Delhi and this has generated a larger divergence in learning equity. The analysis based on regression charts in the two regions unravels varied convergent and divergent patterns regarding technological access, digital literacy, cultural factors, and parental attitudes. Due to the continuous efforts by the Delhi government in the sector, the literacy rate of the students has increased to 86.2%, which is more than the average 25 literacy rate of Indian Students. One of the prominent reasons for this growth can be attributed to the continuous efforts made by the Delhi Government Authorities who invested a sum total of 25.3%, which is a quarter of its budget into education (Economic Survey of Delhi, 2020). Similar initiatives were missing in Varanasi.

Students in Delhi also had greater online learning equity compared to students in Varanasi, with Delhi being a national capital and an X-Class city, implying better educational and technological infrastructure and capacity-building initiatives. Similarly, students who were enrolled in private schools had better access to online education in both cities. The study also revealed the significance of cultural inclusivity in online learning. The diversity of students' cultural backgrounds affects the process and outcomes of online learning. For instance, in Varanasi, students from private schools and higher-income families experience greater educational equity compared to their peers.

The study recommends enhancing teachers' computer proficiency and providing them with technological

tools to overcome barriers to digital skill development in regions with limited technological access. Professional development programs and partnerships to improve ICT infrastructure in schools are also essential to address this issue including greater fiscal allocation towards school education, external financial & social audits of fund utilisation in government departments schools, and building robust digital infrastructure in government & government-aided schools.

Overall, the study reveals that limited access to technology impedes digital skill development, making ICT literacy a crucial factor. Indeed, policymakers should work with schools, students, parents, public and private partners, and civil society to create policies and allocate funding for affordable and user-friendly technological innovations that ensure inclusivity and accessibility to technology and digital infrastructure.

Therefore, crafting an equitable online learning ecosystem necessitates a multifaceted approach that encapsulates students' satisfaction and perceived effectiveness, heightened ICT literacy, cultural inclusivity, and an understanding of parental choices and intentions. By amalgamating insights and strategies in these areas, policymakers and educators can champion the creation of a more inclusive and equitable online learning realm for students.

References

Agarwal, S., & Dewan, J. (2020). An Analysis of the Effectiveness of Online Learning in Colleges of Uttar Pradesh during the COVID 19 Lockdown Page No: 2957. *Journal of Xi'an University of Architecture & Technology, XII*(V), 2957–2963.

Ali, K., Khalil, H., & El-Sharkawy, F. (2020). Impact of online remote education on the learning process among nursing students. *Open Journal of Nursing*, 10(09), 810-830.

Almarzooq, Z. I., Lopes, M., & Kochar, A. (2020). Virtual learning during the COVID-19 pandemic: A disruptive Technology in Graduate Medical Education. *Journal of the American College of Cardiology, 75*(20), 2635–2638. https://doi.org/10.1016/j.jacc.2020.04.015.

Alshmrany, S., & Wilkinson, B. (2017). Factors influencing the adoption of ICT by teachers in primary schools in Saudi Arabia. *International Journal of Advanced Computer Science and Applications*, 8(12).

Alvi, M., & Gupta, M. (2020). Learning in times of lockdown: How Covid-19 is affecting education and food security in India. *Food Security, 12*(4), 793–796. https://doi.org/10.1007/s12571-020-01065-4.

Bordoloi R, Das P, Das K (2021) Perception towards online/blended learning at the time of Covid-19 pandemic: An academic analytics in the Indian context. *Asian Association of Open Universities Journal* 16: 41–60.

Castro, M.D.B., Tumibay, G.M. (2021). A literature review: efficacy of online learning courses for higher education institution using meta-analysis. *Educ Inf Technol* 26, 1367–1385. https://doi.org/10.1007/s10639-019-10027-z

Chuang, Y. (2014). Increasing learning motivation and student engagement through the technology-supported learning environment. *Creative Education*, 5(23), 1969-1978.

Coman C, Țîru LG, Meseșan-Schmitz L, et al. (2020). Online teaching and learning in higher education during the coronavirus pandemic: students' perspective. *Sustainability (Switzerland)* 12(24): 1–22.

Dhawan S (2020) Online Learning: a panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems* 49(1): 5–22.

Duki´c D, Krzic AS (2022) Real-time facial expression recognition using deep learning with application in the active classroom environment. *Electronics* 11(1240): 1–21.

Education Commission (2021), Save Our Future White Paper: Averting an Education Catastrophe for the World's Children, Accessed from https://saveourfuture.world/wp-content/uploads/2020/10/Averting-an-Education-Catastrophe-for-the-Worlds-Children_SOF_White-Paper.pdf

Ferri F, Grifoni P, Guzzo T (2020). Online learning and emergency remote teaching: opportunities and challenges in emergency situations. *Societies,* 10(4): 86.

Florence Martin & Jered Borup. (2022), Online learner engagement: Conceptual definitions, research themes, and supportive practices. *Educational Psychologist* 57:3, 162-177.

Ghazi-Saidi, Ladan; Criffield, Aliisa; Kracl, Carrie L.; McKelvey, Miechelle; Obasi, Sharon N.; Vu, Phu. (2020). Moving from Face-to-Face to Remote Instruction in a Higher Education Institution during a Pandemic: Multiple Case Studies, *International Journal of Technology in Education and Science*, v4 n4 .370-383

Global Education Cluster (2020). Why Investing in Education in Emergency is Paramount?, Accessed from https://www.educationcluster.net/4ReasonsWhyEiEInvestmentisParamount

Greenhow Christine, Charles R. Graham & Matthew J. Koehler (2022) Foundations of online learning: Challenges and opportunities, *Educational Psychologist*, 57:3, 131-147, DOI: 10.1080/00461520.2022.2090364

Inter-agency Network for Education in Emergencies (INEE). (2020). 20 Years of INEE: Achievements and Challenges in Education in Emergencies, New York, NY, Accessed from https://inee.org/resources/20-years-of-inee.

Kara, N., Çubukçuoğlu, B., & Elçi, A. (2020). Using social media to support teaching and learning in higher education: An analysis of personal narratives. *Research in Learning Technology, 28*(1063519), 1–16. https://doi.org/10.25304/rlt.v28.2410.

Kidd, W., & Murray, J. (2020). The Covid-19 pandemic and its effects on teacher education in England: How teacher educators moved practicum learning online. *European Journal of Teacher Education, 43*(4), 542–558. https://doi.org/10.1080/02619768.2020.1820480.

Korkmaz, G. & Toraman, Ç. (2020). Are we ready for the post-COVID-19 educational practice? An investigation into what educators think as to online learning. *International Journal of Technology in Education and Science (IJTES),* 4(4), 293-309.

Liang, R., & Chen, D. (2012). Online learning: trends, potential, and challenges. *Creative Education*, 3(08), 1332-1335.

Mogwe, A., & Balotlegi, P. (2020). Barriers of information communication technology (ICT) adoption in Botswana's primary education*. Journal of Education and Learning (Edulearn),* 14(2), 217-226.

Muralidharan, Karthik, Abhijeet Singh and Alejandro J. Ganimian. (2019). Disrupting Education? Experimental Evidence on Technology-Aided Instruction in India. *American Economic Review*, Vol. 109, No. 4, April 2019. 1426–60.

N. Ndzinisa & R. Dlamini (2022): Responsiveness vs. accessibility: pandemic-driven shift to remote teaching and online learning, *Higher Education Research & Development*.

Ndibalema, P. (2022). Constraints of transition to online distance learning in Higher Education Institutions during COVID-19 in developing countries: A systematic review. *E-Learning and Digital Media*, *19*(6), 595–618. https://doi.org/10.1177/20427530221107510

Newman M, Gough D (2020) Systematic reviews in educational research: methodology, perspectives and application. In: Zawacki-Richter O, Kerres M, Bedenlier S, et al. (eds), *Systematic Reviews in Educational Research Methodology, Perspectives and Application*. Wiesbaden: Springer VS, pp. 1–22.

Palvia, S. (2021). Online education next wave: Peer to peer learning. *Journal of Information Technology Case and Application Research*, 1-16.

R Core Team (2021). *R: A Language and environment for statistical computing*. (Version 4.1) [Computer software]. Retrieved from https://cran.r-project.org. (R packages retrieved from MRAN snapshot 2022-01-01).

Selwyn, N., Hillman, T., Eynon, R., Ferreira, G., Knox, J., Macgilchrist, F., & Sancho-Gil, J. M. (2020). What's next for Ed-tech? Critical hopes and concerns for the 2020s. *Learning, Media and Technology, 45*(1), 1–6. https://doi.org/10.1080/17439884.2020.1694945.

Shahzad, A., Hassan, R., Aremu, A. Y., Hussain, A., & Lodhi, R. N. (2020). Effects of COVID-19 in E-learning on higher education institution students: the group comparison between male and female. *Quality and Quantity*. https://doi.org/10.1007/s11135-020-01028-z.

Singh, Arti and Gupta, Kriti and Yadav, Vivek Kumar, Adopting E-Learning Facilities During COVID-19: Exploring Perspectives of Teachers Working in Indian Public-Funded Elementary Schools (December 18, 2020). Available at SSRN: https://ssrn.com/abstract=3751272 or http://dx.doi.org/10.2139/ssrn.3751272

Smith, D., & Ayers, D. (2006). Culturally responsive pedagogy and online learning: Implications for the globalized community college. *Community College Journal of Research and Practice*, 30(5-6), 401-415.

Tamara Tate & Mark Warschauer. (2022) Equity in online learning. *Educational Psychologist* 57:3, 192-206.

Ter Braak, C. J. F., & Looman, C. W. N. (1995). Regression. In *Data analysis in community and landscape ecology* (pp. 29-77). Cambridge University Press.

The jamovi project (2022). *jamovi*. (Version 2.3) [Computer Software]. Retrieved from https://www.jamovi.org.

Turnbull D, Chugh R, Luck J (2021) Transitioning to e-learning during the COVID-19 pandemic: how have higher education institutions responded to the challenge? *Education and Information Technologies* 26(5): 6401–6419.

UNESCO (2020). Global Monitoring of School Closures caused by COVID-19. Retrieved from https://en.unesco.org/covid19/educationresponse

UNESCO (2020). Education: From disruption to recovery. Retrieved November 9 2020, from https://en.unesco.org/covid19/educationresponse.

UNICEF (2020, August 24). 'What will a return to school during the COVID-19 pandemic look like?'. *UNICEF.* Accessed from https://www.unicef.org/coronavirus/what-will-return-school-during-covid-19-pandemic-look

UNICEF Office of Research - Innocenti, Florence (2020), *Innocenti Research Briefs* no. 2020-20, Accessed from https://www.unicef-irc.org/publications/1119-covid-19-how-are-countries-preparing-to-mitigate-the-learning-loss-as-they-reopen.html

UNICEF. (2020). In-Person Schooling and COVID-19 Transmission: A Review of the Evidence.

UNICEF. (2020). What have we learnt? Overview of Findings from a Survey of Ministries of Education on National Responses to COVID-19.

World Bank (2020), Simulating the Potential Impacts of COVID-19 School Closures on Schooling and Learning Outcomes: A Set of Global Estimates, Policy Research Working Paper Series 9284, Accessed from https://thedocs.worldbank.org/en/doc/798061592482682799-0090022020/original/covidandeducationJune17r6.pdf

World Bank. (2019). Ending learning poverty: What will it take?.