Are students academically weakening from online learning?

Neeyati Saini
Shiv Nadar School, Faridabad, India

Introduction

Online learning is defined as the instruction delivered electronically through various multimedia channels, Internet platforms and applications (Swerdloff, 2016). For several years, online learning has been the key force multiplier for traditional educational methods. The COVID-19 pandemic also emphasized online learning's necessity which most schools relied upon amidst the crisis. The advent of online learning today has brought unprecedented challenges and opportunities for all stakeholders.

Taking cognizance of all viewpoints, this report examines arguments both in proposition and opposition of online learning and the ways it has impacted education. By examining perspectives across global, national, and local contexts, it aims to provide actionable insights to optimize digital education.

Why learn digitally?

The surge in online learning worldwide was primarily driven by unprecedented circumstances namely, the COVID-19 pandemic. Amidst COVID-19, strict government-enforced social distancing measures were instated, catalyzing this rapid adoption of online learning for 1.37 billion students across 138 countries (UNESCO, 2020). During these trying times, digital education offered 'anytime-anywhere' accessibility requiring just a device, the internet and no physical interaction.

Even before the pandemic, digital mediums for online learning gained traction for enabling students to learn at their own pace by revisiting or skipping content as needed. As proved by a Brandon-Hall Study, e-learning requires 40-60% less time than offline learning and proves time-efficient as in-person teaching and commuting for the same to

schools or classrooms becomes redundant (Brandon-Hall Group, 2018). This also allows for ‘differentiated learning’ enabling learners to develop accountability for their education as online learning increases retention to 25-60%, as per Research Institute of America (Pezold, 2017).

Dowson Tong, Vice President of Tencent, emphasized that e-learning offers "inclusion, personalization, and intelligence" to education, catering to diverse learning needs across various age groups (Role of Online Education in Current Scenario for Any University, 2024). It provides interactive experiences tailored for younger audiences and immersive simulations for older students.

The pandemic accelerated technological advancements in education, offering students access to diverse academic resources such as digital libraries, interactive language-learning tools, teleconferencing platforms, and online coaching systems. These tools have transformed how education is delivered, making it more accessible and flexible for learners worldwide. The online education industry is projected to hit $350 billion before 2025 as learners continue to rise (Howarth, 2022).

Post-pandemic surveys by BestColleges revealed that 70% of students perceive online education to be on par with, or superior to, traditional on-campus learning. Furthermore, 95% of online graduates endorsed online education, emphasizing its growing acceptance and perceived effectiveness in meeting diverse learning needs. (“2022 Online Education Trends Report | BestColleges,” 2022).

While online learning provides significant advantages in terms of accessibility and personalized learning, it is also important to evaluate its broader implications. The following section examines these consequences, highlighting both the opportunities and challenges inherent in digital education.

Challenges in Digital Education

Despite the advantages outlined, these benefits are not universally accessible, leading to significant challenges that must be addressed. While online learning offers unprecedented access and flexibility, it also presents serious challenges that disproportionately affect disadvantaged students. As we delve into the consequences of online learning, it becomes clear that this mode of education is a double-edged sword. It addresses some educational gaps while creating new challenges, particularly in terms of equity and engagement.

The successful implementation of online learning requires equitable access to digital tools and resources, which remains a significant barrier in many parts of the world. Despite its potential, online education has exposed deep-seated inequalities in access to technology, exacerbating the existing digital divide. Successful implementation of online programmes requires equitable access to the Internet and latest digital technologies for all students. Despite its necessity during COVID-19, the United Nations revealed that 37% of the world population still faces "internet accessibility" as a significant challenge (Guardian, 2021). Hence, many students struggle to keep up with digital learning. This causes a digital divide between the privileged and disadvantaged backgrounds deepening the economic gap in the education sector as well. The lack of computer literacy additionally poses a challenge.

Due to the pandemic, UNICEF recently observed the divide and regarded this generation of students as the "lost generation" due to the hampering in aspects of their lives including education, healthcare and wellbeing (Arora, 2021). "Children with learning difficulties are being excluded" as shared in a recent study by UNESCO (UNESCO, 2020). Owing to e-learning's features for independent learners, its aftermath result in exclusion and academic challenges of more dependent learners-young learners and special education needs students.

A key consequence is also the ineffectiveness of online learning in delivering experimental and hands-on courses, as observed by ANOVA (Hong et al., 2021). This underscores the limitation of e-learning in supporting practical or teacher-dependent subjects.

To address this, hybrid models combining online theoretical instruction with periodic in-person practical sessions could be implemented. This approach ensures that students receive holistic education while leveraging the strengths of both modalities.

Chronic teacher-student absenteeism has risen, fueled by challenges such as poor emotions, less motivation and 'Zoom fatigue'. Ultimately, These issues have contributed to declining academic performance and reduced engagement in online classrooms. To counteract these issues, schools and institutions have had to implement special mental health support systems, such as virtual counselling and peer interaction activities, to improve engagement and morale among students and teachers. This can also be regarded as a privilege that only schools with sufficient resources and funds in the first place can take advantage of, and may indirectly deepen this social divide.

The Sydney Morning Herald shares the graph (Fig.1) of digital-distraction rates doubling in classes with several students (Baker, 2020). Primarily occurring by online distractions (games and websites), and the absence of a physical invigilator, taking initiative for their learning. A subsequent consequence of this is that online classrooms are unable to maximise "classroom synergy" as online learning fails to recreate an in-person environment resulting in poor impartation of knowledge.

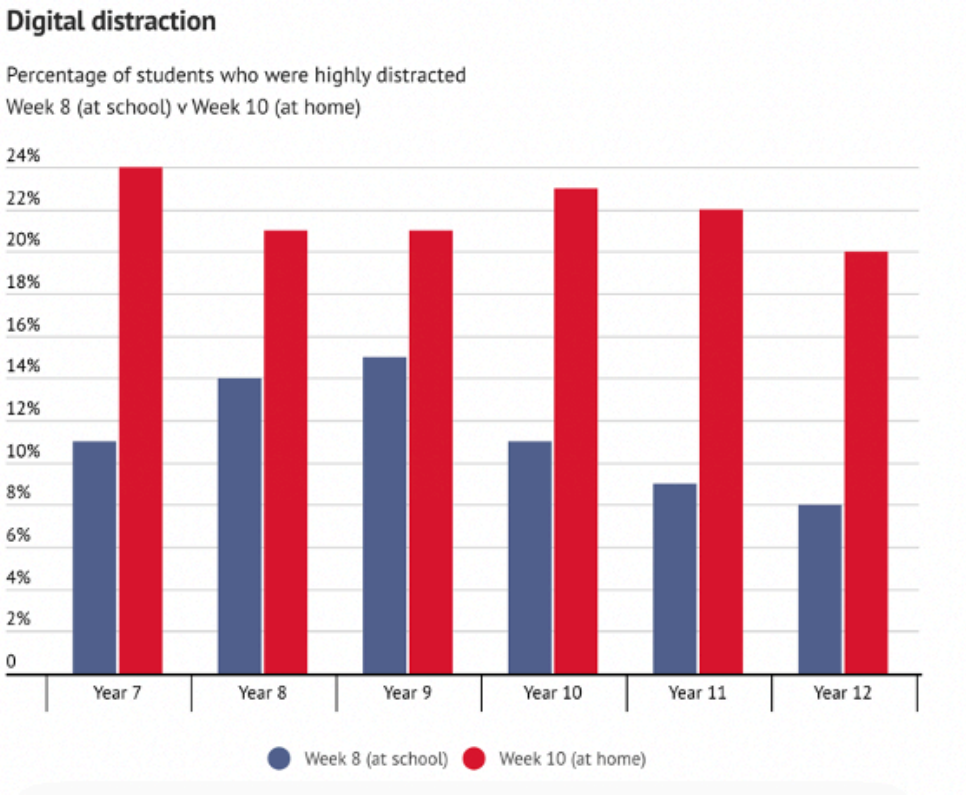

FIGURE 1. Graph by Sydney Morning Herald.

Research indicates that the digital divide significantly affects students from lower-income households. For instance, a study focusing on Malaysian university students found that the transition to online learning during the COVID-19 pandemic exacerbated existing inequalities, as many underprivileged students faced challenges in accessing digital resources essential for effective online education (Subramaniam et al., 2024). Similarly, a report from the United States highlighted that 50% of low-income families lack the necessary technology for online learning, which directly impacts their ability to complete homework and engage

fully in their education (Understanding the Digital Divide in Education | AU, 2020).

The digital divide can be regarded as the most severe consequence of online learning as it generates inequality in education alongside more financial barriers for lower-income students.

Global Perspectives on Online Learning

Given the significant consequences of online learning, particularly the exacerbation of the digital divide and its impact on educational equity, it is essential to examine how these challenges manifest globally, revealing both disparities in access and varying responses from different countries. One major argument for the opposition is shared by the OECD data. Unlike just 5% of students in Switzerland and Norway, 66% in Indonesia lack a device and a stable internet connection for proper education (OECD, 2018).

Michael B. Horn, the executive editor of EducationNext, highlights this lack of “infrastructure, resources and robust plans" in his blog alluding to the ‘backfiring of online learning’(Horn, 2020).

For developed countries like the U.S., Brookings collected data from 5.4 million students, highlighting the significant academic impact of the pandemic, particularly in Math and Reading levels (Nwea, Soland, & Nwea, n.d.). Similarly, i-Ready conducted in-school assessments for approximately 1.6 million elementary learners, which corroborated the decline in academic performance caused by the pandemic (Dorn, Hancock, Sarakatsannis, & Viruleg, 2021).

In the UK, The National Student Survey (Fig.2) observed that because of the pandemic the ‘agreement rate’ for each scale has dropped since 2020 ("The National Student Survey," 2021). UNICEF, taking the drastic digital divide into account, dedicated their voice to “averting the lost generation as COVID-19 threatens to cause irreversible harm to children’s education” highlighting the similar issue of unfinished education ("UNICEF Calls for Averting a Lost Generation," 2020).

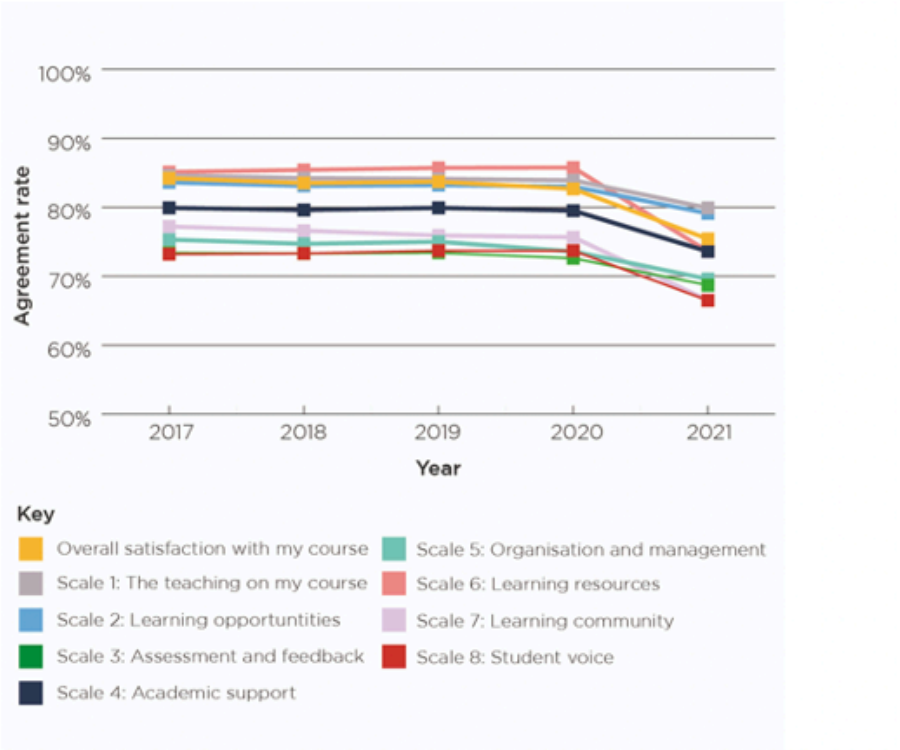

FIGURE 2. NSS published results.

Some argue that the abrupt shift to online learning, necessitated by the pandemic, has disrupted the quality of education by leaving little time for proper planning and adaptation. They cite challenges such as technical difficulties, lack of resources, and insufficient teacher training as obstacles to delivering effective learning. However, others highlight the significant advantages of e-learning, including flexibility, accessibility, and the ability to personalize education. These proponents are optimistic about its potential and advocate for making e-learning an integral part of the education system, envisioning it as the 'new normal' in a rapidly digitizing world.

Wang Tao, Vice President of Tencent Cloud & Education, stated "The integration of information technology in education will be expedited further" and that online education will "eventually become an intrinsic component of classroom instruction". Top learning platform, Coursera, shared its statistics in a recent Impact Report for years of highly progressive growth in new registrations as the pandemic triggered a rise to 92 million in 2021. Enrolment numbers peaked at 189 million ("Learning Impact Report," 2021).

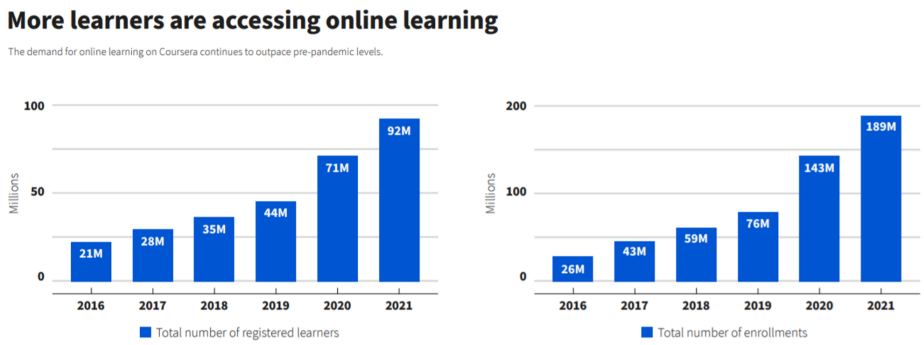

FIGURE 3. Coursera Impact Report statistics.

These increases in remote learners taking higher education courses reflect the growing "global acceptance of online teaching" as also talked about by Wang Tao. International Education Studies presented a similar view about the "easy access" to online material, the ability to record meetings and sessions and retrieve information (Alsayed & Althaqafi, 2022).

A Closer Look: India's National Perspective

At a national level, India has experienced both catastrophes and reimbursements of online learning. The COVID-19 closure troubled 247 million children enrolled in elementary and secondary schools, entrusting many to digital learning (UNICEF, 2021). Eventually, several public policies in different sectors were introduced, to acquaint, as well as, encourage citizens to accept digital technology for a variety of benefits. BYJU's, Chief Operating Officer, Mrinal Mohit added that their app's interactive methods resulted in "higher engagement and increased motivation". He also shared that there has been a "200% increase in the number of new students" upon introducing Free Live Classes (Li, Lalani, & World Economic Forum, 2020). Such initiatives highlight how technology can make education more accessible and engaging when paired with effective outreach strategies.

Ashok Thakur, former Education Secretary and S.S. Mantha, former Chairman of AICTE, in a recent article, concluded their perspective that "online learning is the future" and with the pandemic, the "withering away of the traditional brick and mortar education system has begun" (Thakur, 2021). Many opposing pieces of data also indicate that the pandemic's impact was most severe on students in India merely due to their economic conditions. A recent report by the Azim Premji Foundation brought to

notice that 60% of students in India don't have access to online learning due to a lack of proper internet connection, devices or even basic electricity in the country (Azim Premji University, 2020). Sangeeta Gadre, a professor at the renowned Delhi University, and Amruta Singh, an education expert, shared that "regardless of whether conventional schooling or digital" becomes primary, digital divides "challenges must be accounted for (India Today, 2021).

Local Perspective: Student Experiences

In a report published by professors at Amity University, approximately 1700 pupils from 10 schools in Delhi-NCR were polled. These schools are "geographically dispersed" and "serve students from various socioeconomic classes" and Google Forms was used to administer a questionnaire to them during COVID-19 (Tyagi, 2020). Here, 55% of students claimed that they were well suited to the online medium and 81% of them did not face much difficulty in communicating with the teachers.

While 52% reported adverse effects of online learning health-wise, the majority answered that there wasn't a similar impact on them academically. Harish Tyagi, the publisher of the report also shared that though technology has been used to enhance learning, "online education is not a substitute but an appendage" (Tyagi, 2020).

To validate, I reached out to a narrower audience in my locality (Faridabad) and surveyed similar patterns. The results almost aligned on the social-emotional side of the argument; however, academically, the results differed as the students observed varied (majorly falling) grade results throughout the course of the pandemic. Online learning was claimed to be disadvantageous by 60.6%.

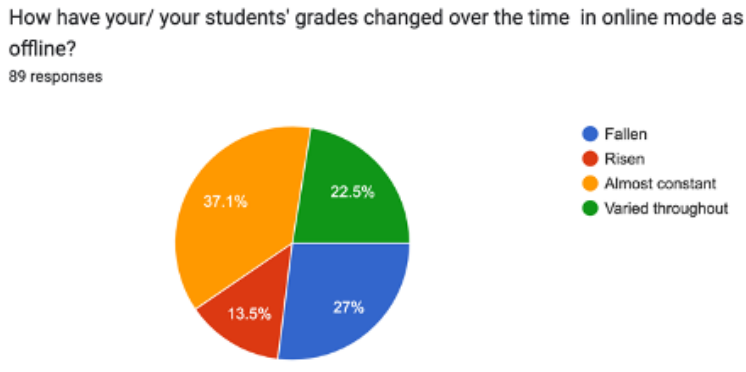

FIGURE 4. Pie-Chart of data from Faridabad locality (Academics)-Primary Data.

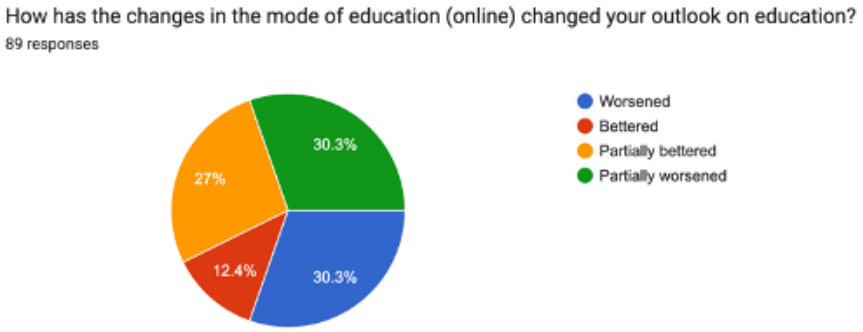

FIGURE 5. Pie-Chart of data from Faridabad locality (Perspective)-Primary Data.

Courses of Action: Strategies for Enhancing Accessibility and Equity

UNICEF proposed a six-point plan aimed at prioritizing education recovery, with "closing the digital divide" as its core objective since 463 million marginalised children lacked remote access to digital mediums. UNICEF urged governments and its partners to "prioritise reopening of schools", "increase education funding" and "close the digital divide by providing internet" (UNICEF, 2020). Governments can further support these efforts by investing in public-private partnerships to expand digital infrastructure, creating affordable device schemes, and offering teacher training to effectively integrate technology into pedagogy.

With the main agendas set by UNICEF, the courses of action I would suggest would be to firstly eliminate financial barriers in e-learning like 'subscriptions' or 'access fees', corresponding to the 200% increase in learners observed by BYJU upon reducing subscription costs. Similarly offering both teacher and students unlimited usage-hours and added features at lower prices boosts engagement. Harvard and MIT announced a transition of their non-profit organisation to further retain more learners for their offered programs as a free-to-degree online education marketplace (edX Press, 2021). With this, I recommend that edtech companies develop more versatile courses to cater to combatting learning

difficulties for certain dependent learners. For them, online learning can also act as a complement rather than a substitute for primitive methods.

NAEP data results, in contrast to national trends, revealed that California students experienced comparatively less academic learning loss. This outcome can be attributed to the state's substantial investment of $23.8 billion to mitigate the effects of disrupted education. Based on this example, it is recommended that governments allocate increased budgets for education to enhance infrastructure, such as affordable Wi-Fi and electricity, enabling a greater number of learners to benefit from online education (California Governor, 2022).

I believe that incorporating a digital format for students in schools would also be a successful action taken by institutions as it would help combat the educational gap caused by a lack of computer literacy. In a survey report by BestColleges, 43% of administrators agreed with the same (BestColleges, 2022).

Evaluation of Sources

The evaluation of sources utilized in this research reveals a spectrum of credibility, ultimately leading to a robust dataset supported by both affirmative and opposing arguments from reputable sources. The final data presented is deemed reliable due to its validation through diverse perspectives, ensuring a comprehensive analysis. Statistics intended for public representation were sourced directly from verified and transparent entities, thereby minimizing the potential for inaccuracies or biases.

The inclusion of publication dates further enhances the credibility and recency of the information. Data from globally recognized organizations such as the United Nations (UN), United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Children’s Fund (UNICEF), ANOVA, and the Organisation for Economic Co-operation and Development (OECD) was integrated alongside national data from governmental archives, including those from the California Governor's office and Zimbabwe's democratic institutions. In addition to statistical data, opinion pieces from students affiliated with prestigious universities such as Harvard, Oxford, and the University of Chicago were consulted.

Although these sources offered insightful information, they frequently lacked thorough statistics or expert opinions. Consequently, news stories from reliable sources—like McKinsey, India Today, The Sydney Morning Herald, and the World Economic Forum—were given precedence. These articles include publication dates and author names, and they are typically

grounded in professional studies, thereby enhancing their reliability. Expert viewpoints were also taken into account, especially those of CEOs and the vice presidents of widely recognised e-learning firms like Tencent and BYJU. Despite having extensive industry experience, these people's opinions could be swayed by special interests in their particular areas. Published polls from reliable sources like Forbes Best Colleges, Amity University, and the National Sample Survey (NSS) were used to offset these opinions.

These surveys are characterized by transparent data collection methods that bolster their credibility. Additionally, counter perspectives from the National Education Secretary and other education experts were included due to their authoritative positions within the field. From local perspectives, there was a recognition that published statistics could be subject to bias or inaccuracies due to insufficient representation of specific localities. To ensure verification of findings, self-created questionnaires were distributed to a broader student population. This approach aimed to capture a more accurate reflection of local experiences regarding online learning.

Conclusion

The research conducted and presented in this paper critically examines the impact of online learning, addressing its benefits and drawbacks across global, national, and local perspectives. It offers well-considered recommendations to mitigate challenges and maximize opportunities, providing a comprehensive understanding of the digital education landscape.

The viewpoint initially tended to focus on the drawbacks of online education, especially the absence of in-person encounters. Nevertheless, examining materials like MIT alumnus Tyler DeWitt's TED Talk, which proposed that "putting the genie of online learning back in the bottle" would be ideal, made many reevaluate its possibilities. In similar terms, Yuval Harari's 21 Lessons for the Twenty-First Century highlighted the need to develop analytical abilities rather than memorising facts, which is consistent with the advantages of online learning over conventional methods.

Online learning is a useful tool, but its efficacy hinges on resolving important problems like the digital divide, accessibility, and ongoing engagement, as the data and research shows. Its execution must be tailored

to ensure inclusivity and balance, complementing traditional education rather than replacing it entirely.

In conclusion, online learning has proven to be a transformative tool in education, offering unparalleled flexibility and accessibility. However, its sustainability depends on addressing systemic inequities, such as the digital divide and inadequate teacher training. By fostering collaborations among policymakers, educators, and technology providers, the future of education can effectively combine the strengths of both online and traditional learning to create a more equitable system. Looking from a holistic view, its execution, for every student, will never reach its true potential unless implemented with the right requirements and balance.

References

1. Alsayed, R. A., & Althaqafi, A. S. (2022). Online learning during the COVID-19 pandemic: Benefits and challenges for EFL students. International Education Studies, 15(3), 122. https://doi.org/10.5539/ies.v15n3p122
2. Arora, A. (2021, April 29). Tracking the situation of children during COVID-19. UNICEF Data. https://data.unicef.org/resources/rapid-situation-tracking-covid-19-socioeconomic-impacts-data-viz/
3. Baker, J. (2020, April 11). Twice as many students distracted at home as at school, new data shows. The Sydney Morning Herald. https://www.smh.com.au/national/twice-as-many-students-distracted-at-home-as-at-school-new-data-shows-20200410-p54iu7.html
4. BestColleges. (2022). 2022 online education trends report | BestColleges. (2022, November 22). BestColleges.com. https://www.bestcolleges.com/research/annual-trends-in-online-education/
5. Brandon-Hall Group. (2018, February 15). Stunning statistics that prove the power of eLearning. Schoox. https://blog.schoox.com/stunning-statistics-that-prove-the-power-of-elearning/
6. California outperforms most states in minimizing learning loss in national student assessment, with record investments to improve education. (2022, October 24). California Governor. https://www.gov.ca.gov/2022/10/23/california-outperforms-most-states-in-minimizing-learning-loss-in-national-student-assessment-with-record-investments-to-improve-education/

7. Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2021, July 27). COVID-19 and education: The lingering effects of unfinished learning. McKinsey & Company. https://www.mckinsey.com/industries/education/our-insights/covid-19-and-education-the-lingering-effects-of-unfinished-learning
8. Guardian staff reporter. (2021, November 30). More than a third of world's population have never used internet, says UN. The Guardian. https://www.theguardian.com/technology/2021/nov/30/more-than-a-third-of-worlds-population-has-never-used-the-internet-says-un
9. Harari, Y. N. (2018). 21 lessons for the 21st century. New York: Spiegel & Grau.
10. Hong, J., Liu, Y., Liu, Y., & Zhao, L. (2021). High school students' online learning ineffectiveness in experimental courses during the COVID-19 pandemic. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.738695
11. Horn, M. B. (2020, March 12). COVID-19 boost to online learning may backfire. Education Next. https://www.educationnext.org/covid-19-boost-online-learning-may-backfire/
12. Howarth, J. (2022, February 22). 75+ incredible eLearning statistics (2023–2027). Exploding Topics. https://explodingtopics.com/blog/elearning-statistics
13. Lark | Business chat & collaboration tool. (2022). Larksuite.com. https://www.larksuite.com/
14. Li, C., Lalani, F., & World Economic Forum. (2020, April 29). The rise of online learning during the COVID-19 pandemic. World Economic Forum. https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/
15. Li, C., Lalani, F., & World Economic Forum. (2020, April 29). The rise of online learning during the COVID-19 pandemic. World Economic Forum. https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/
16. Ndambakuwa & Brand. (2022). Commentary: Many students in developing countries cannot access education remotely. (2022, December 29). The University of Chicago Harris School of Public Policy. https://harris.uchicago.edu/news-events/news/commentary-many-students-developing-countries-cannot-access-education-remotely

17. Nord Anglia. (2020, November 13). COVID-19 and the challenges of virtual learning. Nordangliaeducation.com. https://www.nordangliaeducation.com/tbsw-warsaw/news/2020/11/13/covid-19-and-the-challenges-of-virtual-learning
18. Nwea, M., Soland, J., & Nwea, K. (n.d.). Test score patterns across three COVID-19-impacted school years. https://doi.org/10.26300/ga82-6v47
19. Pezold, S. (2017, March 3). Paycom BrandVoice: LMS 101: Rethinking your approach to employee training. Forbes. https://www.forbes.com/sites/paycom/2017/02/14/learning-management-systems-101-rethinking-your-approach-to-employee-training/?sh=2231cb8f755b
20. PISA - PISA. (2018). OECD.org. https://www.oecd.org/pisa/
21. Press. (2021). 2U, Inc. and EdX to join together in industry-redefining combination. Edx.org. https://press.edx.org/2u-inc.-and-edx-to-join-together-in-industry-redefining-combination
22. Role of online education in the current scenario for any university. (2021). Legalserviceindia.com. https://www.legalserviceindia.com/legal/article-2640-role-of-online-education-in-current-scenario-for-any-university.html
23. Serving the world through learning impact report. (2021). https://about.coursera.org/press/wp-content/uploads/2021/11/2021-Coursera-Impact-Report.pdf
24. St. Amour. (2020). How will colleges with fewer resources fare with coronavirus closures? Inside Higher Ed. https://www.insidehighered.com/news/2020/03/11/how-will-colleges-fewer-resources-fare-coronavirus-closures?utm_source=Inside+Higher+Ed&utm_campaign=6b197cf04c-DNU_2019_COPY_02&utm_medium=email&utm_term=0_1fcbc04421-6b197cf04c-199137489&mc_cid=6b197cf04c&mc_eid=d36e5d3efc
25. Statista. (2022). E-learning: Global market size by segment. (2022). https://www.statista.com/statistics/1130331/e-learning-market-size-segment-worldwide/
26. Strengths and weaknesses of online learning | University of Illinois Springfield. (2022). Uis.edu. https://www.uis.edu/ion/resources/tutorials/overview/strengths-weaknesses
27. Subramaniam, L., Yap, C. S., Jalaludin, F. W., & Hen, K. W. (2024). Digital Divide and University Students' Online Learning amidst

Covid-19 Pandemic in Malaysia. Libri, 74(2), 197–210. https://doi.org/10.1515/libri-2023-0115

28. Thakur, A. (2021, February 16). Online learning is the future. Education ministry and UGC must not hold India back anymore. ThePrint. https://theprint.in/opinion/online-learning-is-the-future-education-ministry-and-ugc-must-not-hold-india-back-anymore/605503/
29. The myths of online education. (2020). Azim Premji University. https://azimpremjiuniversity.edu.in/field-studies-in-education/myths-of-online-education
30. The national student survey: Student experience during the pandemic - Office for Students. (2021). Officeforstudents.org.uk. https://www.officeforstudents.org.uk/publications/the-national-student-survey-student-experience-during-the-pandemic/
31. Today, India. (2021, November 14). 60% students do not have internet access in India: Report. India Today. https://www.indiatoday.in/education-today/news/story/60-students-do-not-have-internet-access-1876720-2021-11-14
32. Tyagi, H. K. (2020, October 17). Online teaching in Delhi-NCR schools in India during COVID-19 pandemic. ResearchGate. https://www.researchgate.net/publication/346846054_Online_teaching_in_Delhi-NCR_schools_in_India_during_Covid-19_pandemic
33. Understanding the Digital Divide in Education | AU. (2020, December 15). School of Education Online. https://soeonline.american.edu/blog/digital-divide-in-education/
34. UNESCO. (2020). Global education monitoring report. https://www.unesco.org/gem-report/en
35. UNESCO. (2020, March 24). 1.37 billion students now home as COVID-19 school closures expand, ministers scale up multimedia approaches to ensure learning continuity. UNESCO. https://en.unesco.org/news/137-billion-students-now-home-covid-19-school-closures-expand-ministers-scale-multimedia
36. UNESCO. (2022). Education: From school closure to recovery. https://www.unesco.org/en/covid-19/education-response
37. UNICEF calls for averting a lost generation as COVID-19 threatens to cause irreversible harm to children's education, nutrition and well-being. (2020). Unicef.org. https://www.unicef.org/press-releases/unicef-calls-averting-lost-generation-covid-19-threatens-cause-irreversible-harm

38. UNICEF. (2020). A six-point plan to protect our children. (2020). Unicef.org. https://www.unicef.org/coronavirus/six-point-plan-protect-children
39. UNICEF. (2021). COVID-19: Schools for more than 168 million children globally have been completely closed for almost a full year, says UNICEF. (2021). Unicef.org. https://www.unicef.org/india/press-releases/covid-19-schools-more-168-million-children-globally-have-been-completely-closed