

Technology Induced Learning During Covid-19: A Review

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ABSTRACT:

Over the past two and a half years, the whole world is facing COVID-19. The majority of countries are affected by this. Even the Education field is a sufferer. Online Teaching is a new way of teaching which play a crucial role during this Pandemic Time. Students can study even from distance and in separation from other companions due to lockdown or isolation periods. This Paper is an attempt to review literature from different sources to analyze the impact of COVID-19 on Education at different levels. There has been a lot of research in this area in a short time, although it is still too early to conclude. Research articles and reports from relevant sources are analyzed, and key findings are summarized by using commonly used management tools. It can also open up discussion about the future of a technology-oriented education system, made possible by advanced technologies such as artificial intelligence, machine learning, simulation, etc. It can also use as a study to compare data during pre and post-COVID-19.

Keywords: *COVID-19, Online Teaching, SWOT analysis, Artificial Intelligence, Machine Learning*

INTRODUCTION

The COVID-19 outbreak started in Wuhan, China spread widely throughout the whole world. Due to COVID-19, the economies of several countries have been severely affected. In addition, the pandemic has affected the business situation of businesses around the world for a month. For many global businesses, the impact of the pandemic is inevitable and uncontrollable.

Offline teaching mode was suspended in a majority of countries. It put a great impact on teaching. Nearly 1.2 billion students suffered and faced the challenge of online learning. According to research, online learning has been demonstrated to boost information retention and take less time, implying that the changes created by the coronavirus are here to stay. Higher education is the final step of formal education and the most sensitive area in today's society (Eddy, Mohammed, Daoodd, et al., 2020)(Eddy, Mohammed, Arif, et al., 2020).

As Gujarat, a state on the western coast of India, geared up to address coronavirus (COVID-19) related emergencies, its authorities knew that 25-30% of students had limited or no access to remote learning devices. Reaching the unreachable was a challenge. Rapidly responding, the state prepared detailed guidelines to ensure that no student was deprived of education. Learning support was provided at the local levels (villages/hamlets/habitats), pairing students with and without devices; promoting peer learning; creating a mobile bank; offline learning; home visits by teachers and field staff; providing access to online classes at citizen service centers or village offices; as well as mobile learning vehicles. Gujarat Government started using Microsoft Teams as a technical platform for teaching. Virtual classes are conducted with a group of students. Students' assignments, tests, and course material are also uploaded on teams. Further, the state makes extensive use of the national open Digital Infrastructure for Knowledge Sharing (DIKSHA) platform that enables QR-coded textbooks to be scanned with a cell phone, opening up a world of resources in multiple languages for reference and further reading. Gujarat recorded the highest number of direct plays of e-content, among all other Indian states, between April and October 2020. Gujarat has thus adopted a multi-modal approach, using a mix of low-tech and high-tech interventions, to deliver personalized, adaptive education.

LITERATURE REVIEW

E-learning has been around since the 1960s, but it only became popular with the emergence of the internet and the web (Bezovski & Poorani, 2016). Since the early 2000s, there has been an increase in research on internet technology, which is the foundation of E-learning (Elango et al., 2008) (Verawardina et al., 2020). Since then, academics all around the world have been reviewing and evaluating E-learning systems and making recommendations to improve the process.

The novel coronavirus that emerged in 2019 worked as a catalyst in increasing the reach and use of E-learning. E-learning has emerged as a major driving factor in the academic world. During the COVID-19 outbreak, it played a critical role in guaranteeing the continuation of teaching and learning (Chang & Fang, 2020).

Before the COVID-19 epidemic, various government activities connected to E-learning were identified. The Virtual School of the National School of Government in the United Kingdom, founded in 1970, GoLearn, now known as USALearning in the United States of America, the Canada School of Public Service Campusdirect, founded in 2004, and the Civil Service College Open Academy of Singapore, founded in 2001 (T.-L. Chen, 2014) are just a few of the older government initiatives in the field of E-learning. Government initiatives on E-learning have grown dramatically over the previous decade, with the Indian government's SWAYAM¹ and DIKSHA², both launched in 2015.

Without a doubt, the arrival of COVID-19 is unexpected; governments are left with little alternative but to rely on virtual learning, especially in times of lockdown. The COVID-19 epidemic has increased the need for E-learning solutions by making them mandatory (García Vazquez et al., 2020) (Radha et al., 2020). Though some governments have to halt learning operations due to a lack of operational E-learning methods, this research piece will aid in the resolution of similar issues in the future by compiling extensive information regarding E-learning initiatives.

As the government attempts to become acquainted with the most recent creation of a complete virtual learning environment, instructors and students are also adjusting to the new development brought about by the COVID-19 epidemic (Abbasi et al., 2020). Teachers, on the other hand, exhibit greater development than students. More than half of the student population faces difficulties with energy and the internet, among other variables affecting their E-learning experience (Subedi et al., 2020). Teachers are affected by students' unfavorable experiences since they are agitated during lessons (Subedi et al., 2020), yet teachers perform better on E-learning platforms (Gohiya & Gohiya, 2020).

(Elango et al., 2008) discovered that students testified to obtaining the necessary support similar to the classroom environment when assessing the quality of E-learning in the Middle East. Similarly, (Loh et al., 2016) assert that students report superior learning results in E-learning, despite concerns regarding the flexibility of self-paced learning, a lack of human interaction, self-motivation, and encouraging teamwork.

While investigating the Indian Government's Digital India initiative, (Kanjilal & Kaul, 2016) provides more information on the Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) and other initiatives such as the National Mission on Education Through ICT (NMEICT), National Programme on Technology Enhanced Learning (NPTEL), a joint program of IITs (Indian Institutes of Technology), and IISc (Indian Institute of Science). Similarly, (Chandwani et al., 2010) demonstrated in their E-learning projects in India that the Indian government has always preferred the use of ICTs as a means of mass education.

To combat school dropout, (Smali et al., 2021) designed a long-term E-learning system. By modifying the traces left by users' interactions with their learning environment, the new model was created using an adaptive E-learning system.

OBJECTIVES

- To conduct SWOT analysis using various secondary sources
- To identify Advantages and disadvantages

METHODOLOGY

Secondary data sources include (a) journals, (b) reports, (c) search engines, (d) firm websites, and scholarly articles, and (e) research papers and other academic publications.

ANALYSIS

By studying various secondary data sources, the following Analysis is concluded

- (R. Radha, K. Mahalakshmi, Dr.V.Sathish Kumar, Dr.AR.Saravanakumar, 2020) taken responses from 175 students. According to their response, around 82.86% of students have reported their self-study skills improved because of e-learning. Even 73.14% of students are satisfied with web-based mock tests. 80.57 % of students agreed that E-learning is very useful during the quarantine time. 80% of students support offline or classroom teaching for the practical session.
- (Ahyani & Kesumawati, 2021) studied the Implementation of E-Learning during the Pandemic Covid-19 at State Vocational High Schools. Strengths include the existence of adequate computer and internet network facilities and the existence of government regulations for implementing e-learning (online) learning at designated schools; the

¹<https://swayam.gov.in/>

²<https://diksha.gov.in/>

computer user has been integrated with the central system and server. Weaknesses reported are Computers are not sufficient, e-learning is not effective if it only has one server, one room, and no backup server, Lack of understanding of school regulations related to e-learning, and no work program for e-learning. Opportunities are adequate school accreditation, Human resources are relatively young and have strong educational credentials, competence, and experience, the number of alumni that are getting bigger, and the level of alumni. Threats reported are Internet and local networks connected to servers often experience problems, expensive bandwidth, and unstable electricity.

- (Mittal & Sharma, 2021) surveyed 370 students using the google form of Punjab Agricultural University, Ludhiana. Strengths include reduction of cost of commuting/ transportation; retention of learning; the possibility of distant learning and saving money. Weaknesses are dependency on the strong network connection, no substitution of classroom teaching, teachers cannot have a check on every student, and lack of transparency in the online exam. Opportunities are it Provides one platform to connect students and teachers from far places, and suited option during lockdown-like situations, frequent meetings can be possible online, and opportunity for a student to contact teachers when needed. Threats are affected to eyes and health, risk of cyber-crime, Lethargy, and affect to private life.
- (Longhurst et al., 2020) collected data from 14 different universities in the United Kingdom and the Republic of Ireland. Strengths identified are the Development of new online resources and upskilling new technologies and resources. Weaknesses reported are time constraints, lack of practical sessions, and issues with assessment. Opportunities are academic collaboration, remote working, and the possibility of blended learning in future curriculum development. Threats reported are decreased student engagement and diminished teacher/student relationships.

ADVANTAGES

During the Pandemic Online learning is a solution. It is only possible if you have all the required resources like a computer or tablet with a high-speed internet facility. It is possible in the city or urban area but in rural areas, it is very difficult to provide all these facilities. Even a lack of technical knowledge is also a barrier to online learning.

With the current COVID-19 outbreak, universities and other educational institutions worldwide are allowed to continue instructional activities through E-learning (or online learning) efforts. This is a significant indicator that E-learning is critical to the worldwide educational system. E-learning delivers essential content that will help students prepare for their academics(W. S. Chen & Yao, 2016).

The system's flexibility is the major advantage of E-learning(Kimiloglu et al., 2017). The system can be accessed at any time and from any location(Nedeva& Dimova, 2010). When compared to traditional learning, there is a significant cost(Arkorful& Abaidoo, 2015) and time savings(Talebian et al., 2014)

(Kimiloglu et al., 2017)identified additional benefits of E-learning such as convenience and accessibility, customization, outsourcing, cost-effectiveness, and employee commitment and motivation. Similarly to this, (Puri, 2018) cited five (5) benefits of e-learning, including consistency, scalability, personation, greater retention, and time and money savings. (Talebian et al., 2014) examined the benefits and drawbacks of e-learning for Iranian agricultural students, identifying its benefits as time and location accessibility, equity, improving group collaboration, direct access to other training resources, enhancing international dimension of educational services, and determining the rate of course progression.

(Mukhtar et al., 2020) found 4 advantages of e-learning, which include Remote Learning, Easy Administration, Accessibility, and Comfort.

(Bączek et al., 2021) did a survey on 804 students and the main advantages according to them were the ability to stay at home, the freedom to learn at your speed, constant access to internet resources, and pleasant settings.

DISADVANTAGES

Inadequate online learning tools, slow internet connections, and a lack of technical proficiency among teachers and students were some of the drawbacks and challenges. Additionally, there were insufficient or no practical sessions, a lack of a uniform, clear policy for the administration of online classes and tests and the distribution of grades, and a time limit on online exams(Al Zahrani et al., 2021).

The unavailability of instructors and cohorts to constantly discuss the course materials and the topic matter is a significant drawback of online learning(Elango et al., 2008).

Technical Problems with equipment, reduced interaction with teachers and parents, Poor home learning environments, a lack of self-control, and social isolation are also disadvantages (Bączek et al., 2021).

Other demerit includes a lack of computer literacy, including the ability to repair hardware issues, manage files, and perform word processing (Gagnon et al., 2007).

(Ambika et al.,2021) done survey on School Students, School Teachers, College Students, and College Faculty. According to their study, they found that In the case of Knowledge transfer offline classes are better. Online teaching platforms need to be improved for better communication.

CONCLUSION

A Pandemic like Covid-19 has never been seen before. Online learning is not a new technique but it becomes a common learning tool due to the Pandemic. Developing and Developed countries started to give more focus to online learning. It has both pros and cons. Pros can be neglected when we saw its benefits during the Pandemic.

The covid-19 pandemic was an unprecedented event. Although E-learning is not a new concept, it gained momentum during the pandemic. Many Countries and Educational institutions are working on the use of online learning. Despite having a few negatives E-learning has several advantages during this period. This pandemic has acted as a catalyst in propagating E-learning to all corners of the globe. Its efficiency can be measured by doing a similar analysis during the Long COVID period. After a few months, sufficient data may be available to analyze the impact of pre, post, and long COVID.

REFERENCES:

1. Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pakistan Journal of Medical Sciences*, 36(COVID-19-S4), S57.
2. Adams, D., Sumintono, B., Mohamed, A., & Noor, N. S. M. (2018). E-learning readiness among students of diverse backgrounds in a leading Malaysian higher education institution. *Malaysian Journal of Learning and Instruction*, 15(2), 227–256.
3. Ahyani, N., & Kesumawati, N. (2021). An Analysis of Strength, Weakness, Opportunity, and Threat (SWOT) Implementation of E-Learning During Pandemic Covid-19. *International Conference on Education Universitas PGRI Palembang (INCoEPP 2021)*, 733–737.
4. Al Zahrani, E. M., Al Naam, Y. A., AlRabeeah, S. M., Aldossary, D. N., Al-Jamea, L. H., Woodman, A., Shaheen, M., Altiti, O., Quiambao, J. V., Arulanantham, Z. J., & Elsafi, S. H. (2021). E-Learning experience of the medical profession's college students during COVID-19 pandemic in Saudi Arabia. *BMC Medical Education*, 21(1), 443. <https://doi.org/10.1186/s12909-021-02860-z>
5. Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance Learning*, 12(1), 29–42.
6. Ambika, Selvaraj., Vishnu, Radhin., Nithin, KA., Noel Benson., Arun Jo Mathew.(2021).Effect of pandemic based online education on teaching and learning system.International Journal of Educational Development,85,1-11. <https://doi.org/10.1016/j.ijedudev.2021.102444> .
7. AZZI-HUCK, K., & SHMIS, T. (2020, March 18). *Managing the impact of COVID-19 on education systems around the world: How countries are preparing, coping, and planning for recovery*. World Bank Blogs. <https://blogs.worldbank.org/education/managing-impact-covid-19-education-systems-around-world-how-countries-are-preparing>
8. Bączek, M., Zagańczyk-Bączek, M., Szpringer, M., Jaroszyński, A., & Woźakowska-Kapłon, B. (2021). Students' perception of online learning during the COVID-19 pandemic: A survey study of Polish medical students. *Medicine*, 100(7), e24821. <https://doi.org/10.1097/MD.00000000000024821>
9. Bezovski, Z., & Poorani, S. (2016). The evolution of e-learning and new trends. *Information and Knowledge Management*, 6(3), 50–57.
10. Bryson, J. R., & Andres, L. (2020). Covid-19 and rapid adoption and improvisation of online teaching: curating resources for extensive versus intensive online learning experiences. *Journal of Geography in Higher Education*, 44(4), 608–623.
11. Chandwani, A., Lihitkar, S., & Anilkumar, S. (2010). *E-learning initiatives in India*.
12. Chang, C.-L., & Fang, M. (2020). E-Learning and online instructions of higher education during the 2019 novel coronavirus diseases (COVID-19) epidemic. *Journal of Physics: Conference Series*, 1574(1), 12166.
13. Chen, T.-L. (2014). Exploring e-learning effectiveness perceptions of local government staff based on the diffusion of innovations model. *Administration & Society*, 46(4), 450–466.
14. Chen, W. S., & Yao, A. Y. T. (2016). An empirical evaluation of critical factors influencing learner satisfaction in blended learning: A pilot study. *Universal Journal of Educational Research*, 4(7), 1667–1671.
15. Chopra, G., Madan, P., & Jaisingh, P. (2019). Article in InteractiEffectiveness of E-learning portal from students' perspective: A structural equation model (SEM) approachve Technology and Smart Education. *Interactive Technology and Smart Education*, 16(2), 94–116. <https://doi.org/10.1108/ITSE-05-2018-0027>
16. Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P., & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, 3(1), 1–20.
17. Demuyakor, J. (2020). Coronavirus (COVID-19) and online learning in higher institutions of education: A survey of

- the perceptions of Ghanaian international students in China. *Online Journal of Communication and Media Technologies*, 10(3), e202018.
18. Di Vaio, A., Boccia, F., Landriani, L., & Palladino, R. (2020). Artificial Intelligence in the Agri-Food System: Rethinking Sustainable Business Models in the COVID-19 Scenario. In *Sustainability* (Vol. 12, Issue 12). <https://doi.org/10.3390/su12124851>
 19. DR.M.PADMAPRIYA, & Dr.N.Kavitha. (2021). A SWOT ANALYSIS: EFFECTIVENESS OF E - EDUCATION DURING COVID – 19 LOCK DOWN. *Journal of Emerging Technologies and Innovative Research*, 8(6), 678–686. <https://www.jetir.org/view?paper=JETIR2106794>
 20. Eddy, Y., Mohammed, M. N., Arif, A. S., Al-Zubaidi, S., Al-Sanjary, O. I., & Sairah, A. K. (2020). 2019 Novel Coronavirus Disease (Covid-19): Design and Development of Disinfectant Fogging System Using IoT Based Drone Technology. *Revista Argentina de Clínica Psicológica*, 29(5), 221.
 21. Eddy, Y., Mohammed, M. N., Daoodd, I. I., Bahrain, S. H. K., Al-Zubaidi, S., Al-Sanjary, O. I., & Sairah, A. K. (2020). 2019 Novel Coronavirus Disease (Covid-19): Smart contactless hand sanitizer-dispensing system using IoT based robotics technology. *Revista Argentina de Clínica Psicológica*, 29(5), 215.
 22. Elango, R., Gudep, V. K., & Selvam, M. (2008). Quality of e-Learning: An Analysis Based on e-Learners' Perception of e-Learning. *Electronic Journal of E-Learning*, 6(1), pp29-41.
 23. Gagnon, M.-P., Légaré, F., Labrecque, M., Frémont, P., Cauchon, M., & Desmartis, M. (2007). Perceived barriers to completing an e-learning program on evidence-based medicine. *Informatics in Primary Care*, 15(2), 83–91. <https://doi.org/10.14236/jhi.v15i2.646>
 24. García Vazquez, A., Verde, J. M., Dal Mas, F., Palermo, M., Cobiانchi, L., Marescaux, J., Gallix, B., Dallemagne, B., Perretta, S., & Gimenez, M. E. (2020). Image-guided surgical e-learning in the post-COVID-19 pandemic era: what is next? *Journal of Laparoendoscopic & Advanced Surgical Techniques*, 30(9), 993–997.
 25. Gohiya, P., & Gohiya, A. (2020). *E-learning during Covid 19 Pandemic*.
 26. Iwayemi, A., & Adebayo, S. O. (2019). Development of a robust library management system. *International Journal of Computer Applications*, 975, 8887.
 27. Kanjilal, U., & Kaul, P. (2016). *The journey of SWAYAM: India MOOCs initiative*.
 28. Khan, B. H. (2015). Introduction to e-learning. In *International Handbook of E-Learning Volume 1* (pp. 29–68). Routledge.
 29. Kimiloglu, H., Ozturan, M., & Kutlu, B. (2017). Perceptions about and attitude toward the usage of e-learning in corporate training. *Computers in Human Behavior*, 72, 339–349.
 30. Levy, Y. (2006). *Assessing the value of e-learning systems*.
 31. Loh, C., Wong, D. H., Quazi, A., & Kingshott, R. P. (2016). Re-examining students' perception of e-learning: an Australian perspective. *International Journal of Educational Management*.
 32. Longhurst, G. J., Stone, D. M., Dulohery, K., Scully, D., Campbell, T., & Smith, C. F. (2020). Strength, weakness, opportunity, threat (SWOT) analysis of the adaptations to anatomical education in the United Kingdom and Republic of Ireland in response to the Covid-19 pandemic. *Anatomical Sciences Education*, 13(3), 301–311.
 33. Mittal, R., & Sharma, P. (2021). SWOT Analysis of Online Teaching During Lock Down: Blended Teaching the Way Forward. *Indian Research Journal of Extension Education*, 56_4, 19–25.
 34. Mukhtar, K., Javed, K., Arooj, M., & Sethi, A. (2020). Advantages, Limitations and Recommendations for online learning during COVID-19 pandemic era. *Pakistan Journal of Medical Sciences*, 36(COVID19-S4), S27–S31. <https://doi.org/10.12669/pjms.36.COVID19-S4.2785>
 35. Nedeva, V., & Dimova, E. (2010). Some advantages of e-learning in English language training. *Trakia Journal of Sciences*, 8(3), 21–28.
 36. Pal, D., & Vanijja, V. (2020). Perceived usability evaluation of Microsoft Teams as an online learning platform during COVID-19 using system usability scale and technology acceptance model in India. *Children and Youth Services Review*, 119, 105535.
 37. Puri, S. (2018, November 16). *5 Advantages of E-learning*. Training Industry. <https://trainingindustry.com/articles/content-development/5-advantages-of-e-learning/>
 38. Radha, R., Mahalakshmi, K., Kumar, V. S., & Saravanakumar, A. R. (2020). E-Learning during lockdown of Covid-19 pandemic: A global perspective. *International Journal of Control and Automation*, 13(4), 1088–1099.
 39. Rambli, D. R. A., Matcha, W., & Sulaiman, S. (2013). Fun learning with AR alphabet book for preschool children. *Procedia Computer Science*, 25, 211–219.
 40. Ratten, V. (2020). Coronavirus (Covid-19) and the entrepreneurship education community. *Journal of Enterprising Communities: People and Places in the Global Economy*.
 41. Sahu, P. (2020). Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. *Cureus*, 12(4). <https://doi.org/10.7759/CUREUS.7541>
 42. Shahzad, A., Chin, H. K., Altaf, M., & Bajwa, F. A. (2020). *Malaysian SME's performance and the use of e-*

commerce: A multi-group analysis of click-and-mortar and pure-play e-retailers.

43. Shahzad, A., Hassan, R., Abdullah, I., Hussain, A., Fareed, M., Yeop, O., Graduate, A., & Business, S. (2020). COVID-19 IMPACT ON E-COMMERCE USAGE: AN EMPIRICAL EVIDENCE FROM MALAYSIAN HEALTHCARE INDUSTRY. *Humanities & Social Sciences Reviews*, 8(3), 599–609. <https://doi.org/10.18510/hssr.2020.8364>
44. Shereen, M., Khan, S., Kazmi, A., Bashir, N., & Siddique, R. (2020). COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research*, 24. <https://doi.org/10.1016/j.jare.2020.03.005>
45. Smaili, E. M., Sraidi, S., Azzouzi, S., & Charaf, M. E. H. (2021). Towards sustainable e-learning systems using an adaptive learning approach. In *Emerging Trends in ICT for Sustainable Development* (pp. 365–372). Springer.
46. Sood, S., & Saini, M. (2021). Hybridization of cluster-based LDA and ANN for student performance prediction and comments evaluation. *Education and Information Technologies*, 26(3), 2863–2878.
47. 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.
48. Talebian, S., Mohammadi, H. M., & Rezvanfar, A. (2014). Information and communication technology (ICT) in higher education: advantages, disadvantages, conveniences and limitations of applying e-learning to agricultural students in Iran. *Procedia-Social and Behavioral Sciences*, 152, 300–305.
49. Uju, E. F., & Olofu, P. A. (2020). *Sustaining learning activities in tertiary institutions in Nigeria amidst COVID-19 pandemic lockdown: The Perspective of E-Learning Strategy*.
50. UNESCO report. (2020). *2020 Global Education Meeting*. <https://en.unesco.org/sites/default/files/gem2020-extraordinary-session-background-document-en.pdf>
51. Vaio, A. Di, Palladino, R., Hassan, R., & Alvino, F. (2020). Human resources disclosure in the EU Directive 2014/95/EU perspective: A systematic literature review. *Journal of Cleaner Production*.
52. Verawardina, U., Asnur, L., Lubis, A. L., Hendriyani, Y., Ramadhani, D., Dewi, I. P., Darni, R., Betri, T. J., Susanti, W., & Sriwahyuni, T. (2020). Reviewing online learning facing the Covid-19 outbreak. *Journal of Talent Development and Excellence*, 12(3s), 385–392.