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[ijirset@gmail.com](mailto:ijirset@gmail.com)

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# Digital Transformation of Education: Defeat Corona with Virtual Classrooms

Amandeep Makkar<sup>1</sup>, Sunil Taneja<sup>2</sup>

Assistant Professor, Department of Computer Science, Arya Girls College, Ambala Cantt, India<sup>1</sup>

Associate Professor, Department of Computer Science, Govt. College, Aharwala (Bilaspur), Yamunanagar, India<sup>2</sup>

**ABSTRACT:** The spread of COVID-19 has led to the closure of educational institutions all over the world. Such closure accelerated the digital transformation of education i.e. development of the online learning environments so that teaching-learning would not be disrupted and the entire world started defeating Corona with virtual classrooms. To meet the current demand, online education industry has scaled up in a massive way. Due to fast technological innovations over the past decade, e-learning is being widely used globally. Under the threat of COVID-19, it has moved quickly and efficiently to fill the gap created by suspended conventional classroom learning. We may not need to go to the institution anymore, but teaching-learning still needs a place. We have been attending dozens of online events for the past two months through virtual rooms created exclusively for the remote work industry. During lockdown, our entire agenda went online - work, school, college, meetings, family activities, religious worship, and even entertainment. We believe this remote work movement has the potential to create a new paradigm for work that has potential of both traditional office and digital office. The goal is to combine the best of both worlds, manifesting a future of work that is more productive, profitable, and fulfilling.

**KEYWORDS:** Corona, COVID-19, Digital, Education, Learning, Online, Technology, Virtual, Virus

## I. INTRODUCTION

The whole education ecosystem is coming together to ensure that learners do not suffer during these times of crisis. While the educators are giving free access to their tools and technologies, learners are responding by utilising the opportunities in great numbers. To meet the current demand, online education industry has scaled up in a massive way. As more and more learners are adding day by day, it is believed that the trend will continue even after the COVID-19 is over because of the unmatched flexibility, convenience and variety offered by online education. There are varieties of reasons to offer online classes [1]

- Highly effective learning environments
- Flexibility
- Convenience
- Accessibility by anyone at anyplace at anytime
- Maintenance of social distance during COVID-19 pandemic
- Interactive support
- Cost saving
- Better feedback mechanism
- Real-time student monitoring and corresponding reports
- Improve the image of your organization by offering technological solutions that solve real problems

In present era, technology is transforming the world at a faster pace that we have never seen before. It is reinventing society in ways we could have hardly imagined just a few years ago. Technologies such as cloud computing, IoT, robotics, mobile apps, e-commerce, wireless communication, data mining have helped in democratizing information and have given access to knowledge at a larger scale than ever before. We are now living in a network society - always connected, always changing and always redefining itself. This digital revolution has taken by storm all aspects of our daily lives. It is not only the 'how we work' that we need to rethink, but also the 'when' and 'where from'. Coping with adaptation towards technological revolution is very challenging across industries, for both employers and employees in the public and private sectors. But it is up to us to face the challenges and make sure that the workplace environment is



keeping up with the technology surrounding it, instead of trying to ignore for as long as possible which, on the long term, would have disastrous consequences. Given the opportunities that technology is providing, it is now the time for us to start rethinking the meaning of work so that we can start redesigning the workplace. Organisations need to become flexible and adaptive in order to survive and because of technology, we now have the opportunity to make it happen. Less hierarchy, more autonomy, simplifying bureaucracy as much as possible and involving employees more in the decisional process should become the norm of the organisation leading the way forward in any kind of industry or sector. In addition, technology is also redefining the physical environment of the workplace. Remote work is becoming more and more the chosen solution now-a-days without being limited by the physical space to look for the most talented employees living in the proximity of the workplace. During COVID-19 lockdown, there is rapid shift of paradigm and the organisations need to drop the idea that efficiency and performance is directly tied with the rules of the physical offices viz. fixed working hours and daily commutes. Instead, remote working organisations rely heavily on collaborative technology and digital tools to help employees thrive in their work. One other aspect is the fact that digital workplaces will need digital employees. Emphasis needs to be put on developing digital literacy both within current generation in the workplace as well as younger generations who will enter the workplace in the upcoming years. At the moment, there is a high percentage of the workforce across the world with real difficulties in using digital tools within the workplace and this is impacting in a negative way both productivity and the workflow within the organisation. Developing learning programs that help them gain digital skills will be critical in the next years, as the requirements of the modern workplaces and the transformation of many of today's jobs could lead to a strong technological unemployment trend which might leave heavy marks on economies and the society. And even if today's younger generations have been heavily exposed to technology since very early in their lives and they are true digital natives, they still need training and education about using digital tools purposefully in the workplace. For this, attention needs to be brought to education systems across the world to integrate digital literacy within the curricula of schools as an essential part of the learning process. At the moment, the gap between skills taught at school and skills required in the workplace is becoming higher and higher and most of it because of this lack of focus on digital literacy. Last but not least, government policies need to be more open to regulating new ways of work supported by technology. We can say that technology will have a massive impact on shaping tomorrow's society and it is our duty right now to try to foresee the changes coming along in the workplace and the forces driving it so that we can adapt to them in the best possible way.

## II. CHANGE IN EDUCATIONAL SCENARIO

The COVID-19 has resulted in academic institutions shut all across the world. Globally, over 1.2 billion children are out of the traditional classrooms. As a result, education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Research suggests that online learning has been shown to increase retention of information, and take less time, meaning the changes corona virus have caused might be here to stay. While countries are at different points in their COVID-19 infection rates, worldwide there are currently more than 1.2 billion children in approx. 190 countries affected by school closures due to the pandemic. With this sudden shift away from the classroom in many parts of the globe, some are wondering whether the adoption of online learning will continue to persist post-pandemic, and how such a shift would impact the worldwide education market. Even before COVID-19, there was already high growth and adoption in education technology, with global edtech investments reaching US\$18.66 billion in 2019 and the overall market for online education projected to reach \$350 Billion by 2025. Whether it is language apps, virtual tutoring, video conferencing tools, or online learning software, there has been a significant surge in usage since COVID-19.

## III. RESPONSE OF EDUCATION SECTOR DURING COVID-19

In response to significant demand, many online learning platforms are offering free access to their services, including platforms like BYJU'S, a Bangalore-based educational technology and online tutoring firm founded in 2011, which is now the world's most highly valued edtech company. Since announcing free live classes on its Think and Learn app, BYJU'S has seen a 200% increase in the number of new students using its product, according to Mrinal Mohit, the company's Chief Operating Officer. Tencent classroom, meanwhile, has been used extensively since mid February after the Chinese government instructed a quarter of a billion full-time students to resume their studies through online platforms. This resulted in the largest "online movement" in the history of education with massive number of students, attending classes via the Tencent K-12 Online School in Wuhan. Other companies are bolstering capabilities to



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provide a one-stop shop for teachers and students. For example, Lark, a Singapore-based collaboration suite initially developed by ByteDance as an internal tool to meet its own exponential growth, began offering teachers and students unlimited video conferencing time, auto-translation capabilities, real-time co-editing of project work, and smart calendar scheduling, amongst other features. To do so quickly and in a time of crisis, Lark ramped up its global server infrastructure and engineering capabilities to ensure reliable connectivity. Alibaba’s distance learning solution, DingTalk, had to prepare for a similar influx: “To support large-scale remote work, the platform tapped Alibaba Cloud to deploy more than 100,000 new cloud servers in just two hours last month – setting a new record for rapid capacity expansion,” according to DingTalk CEO, Chen Hang.

#### IV. ANALYSIS OF COVID-19 IMPACT ON EDUCATION

Fig. 1 depicts the impact of COVID-19 on the global education by UNESCO showing number of learners impacted by national school closures worldwide.

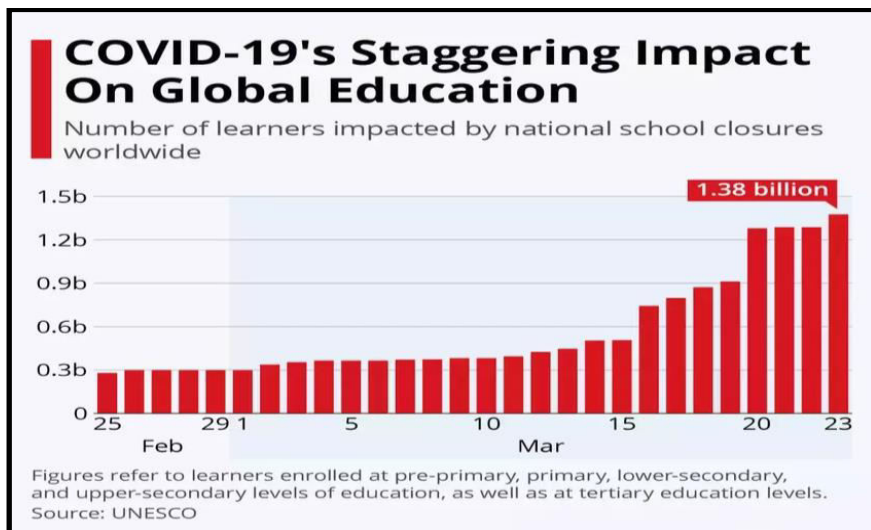


Fig. 1 Impact of COVID-19 on Education (Source: UNESCO)

Fig. 2 give below correspond to number of learners enrolled at pre-primary, primary, lower-secondary, and upper-secondary levels of education [ISCED levels 0 to 3], as well as at tertiary education levels [ISCED levels 5 to 8].

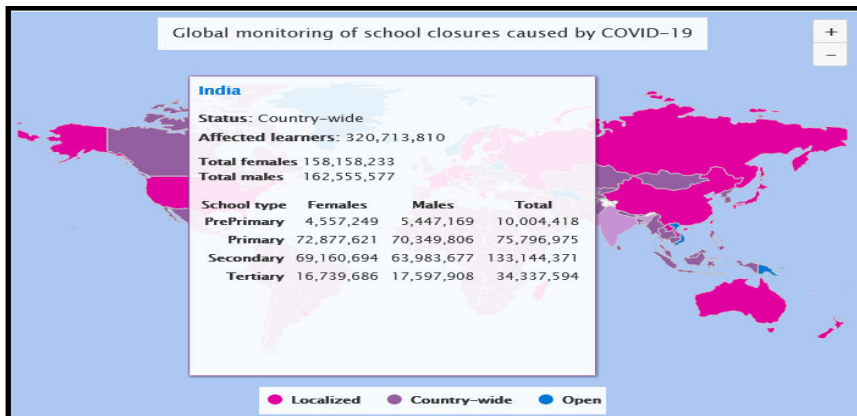


Fig. 2 Affected Learners in India (Source: UNESCO, 18<sup>th</sup> May 2020)



## V. THE CHALLENGES OF ONLINE LEARNING

There are, however, challenges to overcome in successful implementation of online learning. Some students without digital infrastructure and reliable internet access struggle to participate in digital learning; this gap is seen across countries and between income brackets within countries. For example, whilst 95% of students in Switzerland, Norway, and Austria have a computer to use for their schoolwork, only 34% in Indonesia do, according to OECD data. In the US, there is a significant gap between those from privileged and disadvantaged backgrounds: whilst virtually all 15-year-olds from a privileged background said they had a computer to work on, nearly 25% of those from disadvantaged backgrounds did not. While some schools and governments have been providing digital equipment to students in need, such as in New South Wales, Australia, many are still concerned that the pandemic will widen the digital divide.

### Is learning online effective?

For those who do have access to the right technology, there is evidence that learning online can be more effective in a number of ways. Some research shows that on average, students retain 25-60% more material when learning online compared to only 8-10% in a classroom. This is mostly due to the students being able to learn faster online; e-learning requires 40-60% less time to learn than in a traditional classroom setting because students can learn at their own pace, going back and re-reading, skipping, or accelerating through concepts as they choose. Nevertheless, the effectiveness of online learning varies amongst age groups. The general consensus on children, especially younger ones, is that a structured environment is required, because kids are more easily distracted. To get the full benefit of online learning, there needs to be a concerted effort to provide this structure and go beyond replicating a physical class/lecture through video capabilities, instead, using a range of collaboration tools and engagement methods that promote “inclusion, personalization and intelligence”.

## VI. REMOTE WORK TOOLS AND OPEN EDUCATIONAL RESOURCES TO KEEP LEARNERS ENGAGED AT HOME

Given that the pandemic has caused widespread school closures in approx. 190 countries and 89.4% of learners forced to stay home, OERs are important to supplementing formal online classes and even temporarily serving as the main form of education for those who are unable to access online learning. Many educational institutions and private publishing and assessment companies have opened up their resources so that students in quarantine who may not otherwise have access to learning resources at this time may still continue to learn. UNESCO has also identified a number of MOOCs and OERs which can provide online courses and self-directed learning content through both mobile and desktop platforms. In the Indian e-learning market, some of the popular e-learning platforms and digital innovations to combat COVID-19 are given below:-

- **WhatsApp, Telegram, Kaizala:** These are the digital platforms for various purposes viz. messaging, chatting, voice calling, video calling, video-conferencing and digital contents sharing.
- **Skype, Zoom, Google Meet, Cisco WebEx, Adobe Connect, Microsoft Teams, GoToWebinar, GoToMeeting:** These are the collaborative platforms for various purposes viz. messaging, chatting, calling, online meetings, video-conferencing, screen sharing, web-conferencing and digital contents sharing.
- **Thinglink, Nearpod, Trello, Screenr, Screen-O-Matic, Kaltura, OBS Studio, Lexis Audio Editor, CamStudio, DU Recorder, Kine Master, EdPuzzle, Squigl, Ezvid:** These digital tools are used by the educationists for the development of various types of digital contents viz. course work, lesson plans, assignments, audio lectures, video lectures, interactive images etc.
- **Google Classroom:** It helps the teachers and students to connect remotely and share assignments/study material in organized manner.
- **Moodle:** It is an open learning platform/management system that makes an individual to create its own personalized learning environment.
- **Seesaw:** It helps the user to create digital learning resources and remotely share the same with each other.
- **Skooler:** This educational software and LMS application helps teachers & students to share the digital contents and also supports the school administration for effective planning and assessment.



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- **Edmodo:** This LMS application helps school administration, teachers, students and their parents to connect with each other. One can share digital resources viz. study material, assignments and schedule tests & assess performance on this digital tool.
- **National Programme on Technology Enhanced Learning (NPTEL):** This is a venture of MHRD to provide quality education primarily executed by seven IITs and IISc whereby lots of free online courses/programmes are offered through MOOCs platform.
- **WizIQ:** This is used in academic institutions and organizations for blended learning. IIT, Delhi also offers online classes through this platform.
- **EdX:** This platform disseminates interactive online courses through virtual classrooms from prominent educational institutions worldwide.
- **Coursera:** It is a platform that has partnership with number of universities and academic institutions to impart quality online education for free.
- **FutureLearn:** It is also one of the online education learning platforms used by millions of the people across the globe. It provides facilities to develop the digital contents in a flexible and reliable way.
- **Udemy:** This platform provides good quality online interactive courses in multiple languages especially wide coverage of computer related courses.
- **Oliveboard:** it is one of the largest e-learning platforms for banking and government job aspirants, is providing #GharPeCoaching, a free course for all banking exams to all aspirants across the country.
- **YouTube:** It contains massive quality videos pertaining to educational sector which can be accessed with ease by anyone.
- **British Council:** It is an organization that provides variety of opportunities to learn English language through recorded lectures, digital study material, webinars etc.
- **Byju's:** This supplement learning platform is most popular among school students. It contains huge repositories of educational videos. It quenches the thirst of millions of students across the globe.
- **Quizlet:** This platform provides an easy way to teach and learn in multiple languages. It makes to learn the concepts in a simple way using games, flashcards etc.

Fig. 3 depicts various quality parameters w.r.t Massive Open Online Courses viz. accessibility, flexibility, innovation, convenience etc.

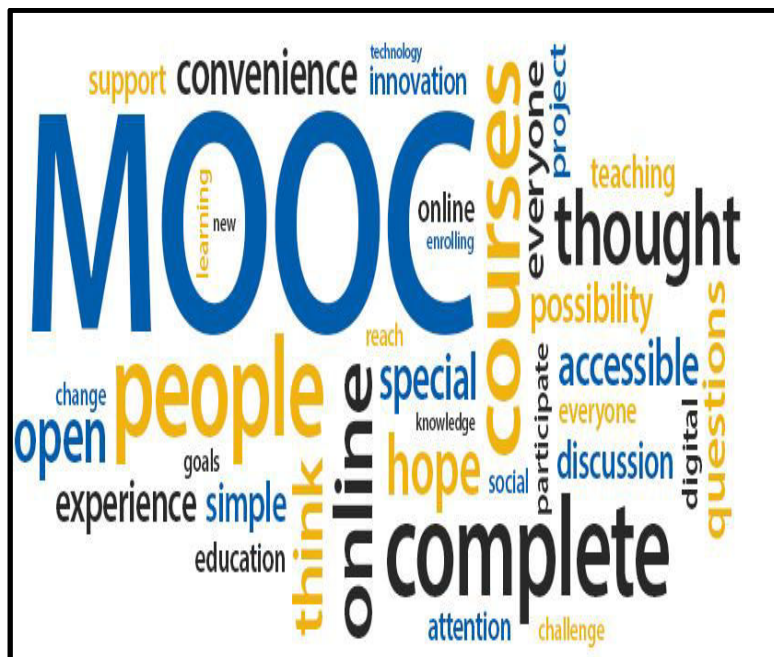


Fig. 3 Quality Parameters of Massive Open Online Courses



Fig. 4 depicts various remote work tools and prominent online resources.

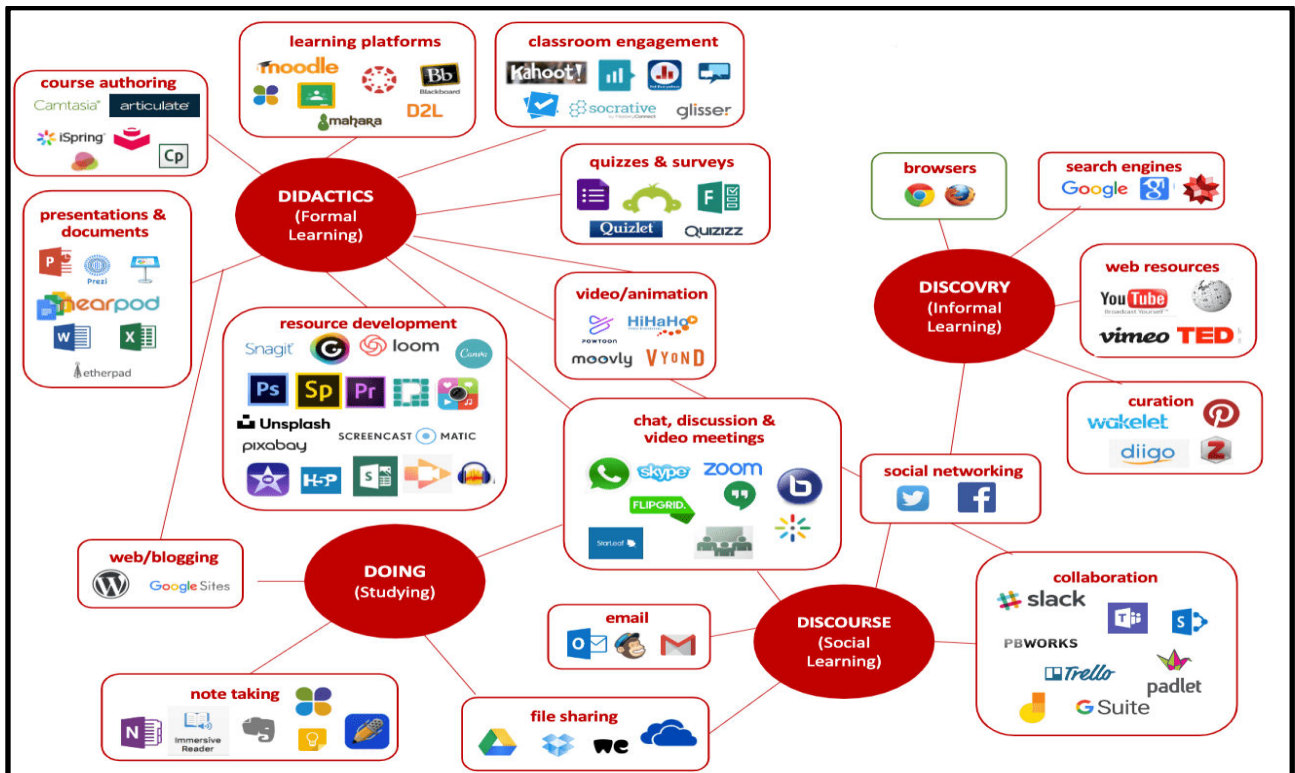


Fig. 4 Remote Work Tools

Fig. 5 elaborates on Online Educational Resources to support professionals and learners in digital learning.



Fig. 5 OERs to support professionals & learners in digital learning

Fig. 6 depicts the use of various collaborative platforms by professionals/learners at remote places for providing/taking digital education.



Fig. 6 Educational System during COVID-19 through digital innovation

## VII. CHALLENGES DURING SHIFTING TO REMOTE WORK

Adaptability in this era of digital transformation is critical. The leaders have been forward-thinking in terms of how to best enact such change, the actual execution has been troublingly slow. The corona virus is now speeding up the process of technological transformation and consequently, compelling many companies to confront their digital shortcomings. Such challenges in shifting to remote work includes:-

- A drop in overall productivity of teachers being isolated from students/library/other teachers.
- Lack of shared knowledge when it comes to what a certain task/project requires.
- Teachers are falling short of the necessary support provided by authorities.
- Difficult to ensure that the learners are engaged in virtual classroom
- Lack of digital infrastructure for reliable online learning.
- Lack of proper skills/methodologies while imparting online education.
- Risk of Computer Vision Syndrome for online learners.

## VIII. BENEFITS OF VIRTUAL TRAINING

Educational Organizations must ensure the safety of their employees, keep students loyal while learning, and maintain their fiscal health. This is a balancing act even in the best of times. But the COVID-19 lockdown makes it a seemingly impossible task. Fortunately, virtual training through web conferencing software can boost team morale and bring everyone together as well as bridge skill gaps, enhance collaboration, and improve remote work practices. Working remotely through web conferencing tools help bridge the divide and bring everyone into the fold. Even natural introverts feel connected to the organization. It strengthens the team dynamic because everyone has the opportunity to communicate and collaborate with peers.

- Eliminate Travel Expenses
- Reduce Online Training Seat Time and associate payroll expenses
- Personalize Performance Management
- Repurpose Existing Online Training Resources
- Target Emerging Online Training Gaps
- Utilize In-House Experts
- Strengthen the Team Dynamic
- Reduce Compliance Risks Rapidly





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## IX. CONCLUSION

The COVID-19 crisis is possibly one of the most severe pandemics we all have witnessed in this century. The resilience, grit and determination displayed by the citizens and the bold initiatives undertaken by the Government, during this crisis, have been remarkable. Everyone has stood united to overcome this challenge. be it our public servants, doctors, health care professionals, educationists, big business houses or small traders. While some believe that the unplanned and rapid move to online learning – with no training, insufficient bandwidth, and little preparation – will result in a poor user experience that is uncondusive to sustained growth, others believe that a new hybrid model of education will emerge, with significant benefits. “I believe that the integration of information technology in education will be further accelerated and that online education will eventually become an integral component of education. From around the world, startup founders and venture capitalists gathered to network with one another and reveal to the world the latest and greatest technology that will enable the future of location independent work. The famous academicians and experts in the education sector have indicated the following revolutions in the field of education technology in the times to come viz. virtual reality, augmented reality, mixed reality, m-learning, digital twins, IoT, cloud computing, data analytics, robotics etc. It is possible that in times to come, a student may be allowed to carry out online courses from any College/University irrespective of his location and finally get degree from their parental university.

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