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Digital Innovation in Education during Pandemic

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Abstract

The development and significant increase of COVID-19 has challenged the traditional practices in key sectors of the modern-day world including healthcare, education, business and development. Restrictive measures to diminish the spread of disease also restricted the access to the basic necessities of life. Countries-wise lockdowns to maintain social distancing has not only transformed the traditional mode of education to online but also opened the new avenues for digitalization of education. This chapter discusses various strategies and methodologies to rectify the setback to education sector due to COVID-19, the challenges and barriers in their implementation and the future of online learning.

Keywords: *Digital Innovation, Pandemic, Education*

Introduction

In the Wuhan City, Hubei province of China, new cases of pneumonia of unknown etiology were first identified that were officially named by WHO as “COVID-19” which represent phrase “Coronavirus disease 19” because of its spread caused by fresh coronavirus (Chen et al., 2020). COVID-19 is caused by SARS-CoV-2: a pleomorphic or spherical enveloped, single-stranded (positive-sense) particles (Mousavizadeh & Ghasemi, 2020). The infection of COVID-19 in China has spread transnationally and presented a severe threat to countries across the globe (Chen et al., 2020). Almost 214 countries reported the COVID-19 confirmed cases (Chakraborty & Maity, 2020). According to the World Health Organization (WHO), the coronavirus is a "international concern" for public health. WHO reported 257,469,528 confirmed cases and 5,158,211 confirmed deaths due to COVID-19 worldwide till November 23, 2021 (WHO, 2021). The transmission of SARS-CoV-2 virus through droplet scattering (coughing/sneezing) has resulted in the fast spread of COVID-19 (Cássaro & Pires, 2020). Therefore, in almost all areas of life, COVID-19 restrictions are applied (WHO, 2020). Along with following basic hygienic rules, countries have taken very unembellished restrictions such as school vacations, quarantine

in highly affected areas, online working and most importantly, lockdown to slow down the COVID-19 outbreak (Saadat et al., 2020).

Within the education sector, there is a standard shift to deliver quality education through digital transformation. Despite the challenges posed to both learners and the educators, distance keeping, online learning and continuing education have become a cure for this extraordinary global pandemic. The term "online learning" refers to the process of learning in synchronous or asynchronous settings using various internet-connected devices, such as computers and mobile phones. Students can communicate with their fellow students and study with their teachers using these environments at any location (Singh & Thurman, 2019). When switching from traditional in-person instruction to online instruction, both educators and students must adjust to a whole new environment where there are few or no other options.

E-learning resources have proven invaluable throughout this epidemic, supporting academic institutions and facilitating student learning even as these institutions were closed (Subedi et al., 2020). Staff and student readiness to adjust to the new changes must be assessed, and appropriate support must be provided. While learners with a static mindset find it difficult to adapt, those with a progressive mindset become immediately comfortable in new learning environments. Online learning does not provide one-size-fits-all education; instead, it offers a variety of subjects for a range of learning needs. Different approaches to online learning are required for different age groups and subjects (Doucet et al., 2020). Additionally, students who are physically unable to participate in a virtual learning environment with restricted mobility can do so through online learning (Basilaia & Kvavadze, 2020).

After schools were closed to deal with the global epidemic, instructors, parents, and kids felt the unexpected ripple impact of the COVID-19 pandemic all across the world. Education systems are working hard to continue providing high-quality education even while frontline workers, health officials, and governments try their hardest to contain the spread. Due to their emotional and psychological anguish, many students who live at home have not been able to participate in class in a productive way. The best methods for homeschooling remotely have not yet been identified (Petrie, 2020). The use of appropriate and pertinent training for online learning may depend on the educators' and learners' exposure to information, communications technology (ICT), and competence (Pokhrel & Chhetri, 2021).

In order to support critically and reflectively informed praxis, it is imperative that individuals, networks, projects, public discourses, and research be actively engaged during the COVID-19 epidemic. Critical applied research methods must be presented and advanced, and concepts for the democratic and emancipatory digitalization of education must be developed. Furthermore, a more comprehensive conversation about the kind of society we wish to see emerge in the post-COVID-19 era is necessary for educational purposes. During this pandemic, technology and its suppliers should evolve in tandem (Teräs et al., 2020).

Universities have made a significant shift to online instruction in order to support emergency response and address the importance of the social distancing measures mandated by Covid (Krishnamurthy, 2020). Academics worldwide have had to quickly adapt their approaches and resources to a format that can be delivered online in order to make this shift (Dwivedi et al., 2020). This change happened quickly and was required by the situation. The epidemic required the remote instruction during a time of widespread testing (Govindarajan & Srivastava, 2020).

Some studies refer to this new method as "emergency online education" (Marinoni et al., 2020). The system presented previously unheard-of difficulties for staff and university leaders as well as students who required technological support and had to quickly reinvent themselves in order to maintain campus operations.

Even while the digital transformation process had long ago, the epidemic sped it up, resulting in visible changes within a few weeks. As per most HEIs acknowledge, this technology revolution in education involves thoughtful adjustments to teaching strategies, evaluation techniques, and core competencies (Jensen, 2019). This shift from "in-person" to "virtual" education has needed significant modifications to ways of evaluating learning outcomes in addition to a reevaluation of the competences and skills that students must possess in this new environment (Jensen, 2019).

Digital Transformation in the Education Sector

Although technological advances and innovations have always been working for betterment in education sector but due to entire dependence on digital sources, the COVID-19 pandemic had a huge influence on education. It also grants an opportunity to research best practices in pedagogies, assessments and technologies for personal connection, to uphold the level of engagement and presence as would be anticipated within a face-to-face classroom environment. Following trends emerged and required in education sector to maintain the academic integrity in response to COVID-19:

Flipped classroom

The flipped classroom is a simple policy for providing learning resources such as articles, YouTube links and pre-recorded videos before the class. The online classroom time is utilized to discuss with faculty and peers for deepen understanding of the subject and topic (Doucet et al., 2020). This is a very effective way of encouraging self-directed learning, critical thinking and problem-solving skills (Pokhrel & Chhetri, 2021).

Online learning environments

The computer-generated classrooms can be directed by means of customizable cloud-based learning management and platforms such as video conferencing (Zoom, CiscoWebEx, Google Hangouts Meet, Slac, Elias, Moodle).

Teachers can design instructional training, courses, and skill development programs using integrated communication and collaboration systems like Google Classroom, Blackboard, Microsoft Teams, and Canvas. They provide features like file storage, workplace chat, and video conferencing that make lessons organized and simple to use. Generally speaking, they facilitate the exchange of numerous types of content, including Word, Excel, PDF, audio, and video files. These also enable the tracking and evaluation of students through the use of quizzes and the evaluation of completed assignments using a rubric.

Much larger audience is required for webinars that is also called virtual classes. One advantage is that knowledge can be acquired from professionals worldwide. Virtual classroom discussions that precede or follow up with department discussions can enhance the learning outcomes of webinars (Kaup et al., 2020).

Video conferencing

Through the integration of video conferencing, the educational system provided students with the ability to participate in all of their lectures, classes, and webinars remotely. Assessment and student onboarding can also be conducted using video conferencing.

Online platforms and learning softwares

Learning tools and internet platforms enable educational systems to switch from in-person coaching to remote learning for the period of the COVID-19 epidemic, enabling students and instructors all around the world to continue their studies. Meanwhile, Tencent Classroom has seen widespread use since the middle of February, following the Chinese government's decision to allow a quarter of a billion full-time students to complete their education online.

Other businesses are setting up shop to offer instructors and students a continuous facility. For instance, Lark, a collaboration suite based in Singapore, started providing teachers and students with auto-translation capabilities, limitless video conferencing time, real-time co-editing of project work, and ByteDance, among other features, as an internal tool to meet its own progress. These features prompted the introduction of additional smart calendar scheduling. Lark strengthened its engineering expertise and global server infrastructure to guarantee reliable connectivity in a time of crisis and to do so swiftly.

DingTalk CEO Chen Hang stated that Alibaba's remote learning platform, DingTalk, had to brace for a comparable surge: In order to facilitate extensive remote work, the platform partnered with Alibaba Cloud to launch over 100,000 new cloud servers in a mere two hours last month, breaking previous records for speedy capacity expansion".

Apart from that, several school districts are creating unique alliances to provide local educational programming. One such alliance is that of PBS SoCal/KCET and The Los Angeles Unified School District, which has distinct channels catering to various age groups and digital alternatives.

Open online course

It's time to motivate educators and learners to acquire new skills and improve current ones. Massive Open Online Courses (MOOCs) are just one type of the many online courses that offer flexible learning. These consist of websites such as Coursera, NPTEL, FutureLearn, Swyam, and so on. The courses may be offered without charge, or there may be a certification fee. These courses may cover a wide range of ophthalmology-related subjects or other pertinent subjects including personality development, research and publication, and communication skills (Kaup et al., 2020).

Virtual reality (VR) and augmented reality (AR)

Complicated topics and complex subjects can be better explained and visualized by VR and AR. This engages more students and makes learning easier, especially when they're learning remotely, without access to all other regular educational facilities.

Computational Intellect

AI and ML provide writing and voice recognition technologies to help students and tutors. For instance, AI chatbots can communicate with, instruct, and assess pupils' progress. Artificial intelligence (AI) evaluation tools and facial recognition software make sure that pupils are not

cheating and look at how they behave throughout tests. AI data analytics technologies provide each learner with a more customized learning experience.

Mobile applications

Mobile phones and applications show a major part in virtual education for students mainly in zones wherever learners depend on newly set up hotspots for Internet contact as web and desktop technologies. The learning division should offer mobile education uses because they enable pupils to access information in ways that are appropriate for their personal environments. Students should have access to a variety of study resources, including PDFs, audio and video files, and text, on any device.

Issues with digital transformation in education: New problems and complications in the current situation

The troublesome properties of COVID-19 caused educational activities to quickly change. As previously explained, the quick decline of in-person instruction required both instructors and students to adjust to a radical modification in the nature of the teaching-learning process (Carolan et al., 2020). Although the trends mentioned above present exciting new potential, the transition to the new digital world was not without difficulties. Several problems and barriers arose throughout this process (Marinoni et al., 2020; Mishra et al., 2020). The following are some of the main problems with the digital revolution of education:

Technical issues

The technical problems were the major challenges in adapting to online learning reported by the students (Mishra et al., 2020). Some writers draw attention to the ways in which online learning can close the digital gap (Govindarajan & Srivastava, 2020). Institutions should mobilize resources to guarantee that all students have access to a suitable IT infrastructure and broadband connection, together with specialized support to address technical issues, in order to lessen this barrier (Carolan et al., 2020). In this new environment, higher education institutions need to guarantee that students from low socioeconomic backgrounds will not face discrimination and guarantee an equal student experience.

Challenges with new interfaces and technology utilization

Teachers and students must adjust to the unfamiliar and complex interfaces of new online systems, and they may be unwilling to participate in new procedures because they lack experience or are afraid of making a mistake. Additional training is required for every new IT system, which can be disastrous for all parties. Although it's expected that today's kids are tech-savvy and can easily adjust to online learning and gadget use, this isn't always the case since some tutors and scholars might not be as tech-savvy as others. Basic technical training should be provided to teachers and students to ensure the best possible use of the online platform. Avoid stabbing for everything at once. Take it carefully and get everyone on board. Tech-savvy instructors and students can serve as e-leaders to help the entire group adopt the program. Lack of access to computers and reliable internet connectivity could be a barrier to digital education. Limiting the amount of time spent online, scheduling flexibility, and showing empathy for those who are struggling with these issues can all help manage this burden. Assuming remote learning can be made easier by the institution's strong IT staff.

In general, people prefer to carry out tasks in the same manner that they have in the past. The development of completely new techniques and persuading individuals to use them in order to do activities that they previously believed they had completed successfully. This primarily applies to schooling.

People should be aware of how new educational technologies might enhance and supplement more traditional teaching approaches, and they should make an effort to implement them as they will simplify some aspects of their work. Still, a lot of people are reluctant to make the big move toward digital transformation. The issue of whether or not to switch to digital learning in the classroom still affects both individual educators and administrators of institutions of higher learning.

To gain their support, this transition must be completed. To do this, individuals must be educated about digital transformation, assisted in comprehending its advantages for themselves and their pupils, and given the necessary skills in bite-sized portions.

New Distractions

Students can be distracted by other applications on their devices and may misuse educational technology.

Legacy systems

The transformation of new tools and solutions may require extra time and money to resolve as existing systems may not be compatible with them.

Training in clinical and surgical skills

The majority of hands-on training in virtual learning cannot be conveyed by online instruction alone. Online apps can be used for simulation-based training to handle this partially. Besides this, Ophthalmology still remains the biggest challenge

Student engagement

Student engagement can be challenging for teachers because of the concerns such as internet issues, attention period, poor audio and video quality, multi-tasking while attending sessions etc. Tools like live one-to-one chat purpose, virtual whiteboards, pop quizzes, reflections and polls etc. can be used to overcome these issues by designing smaller and additional collaborative lessons. Utilizing applications such as Kahoot, Poll, and Google Forms all over can make sure that learners pay attention. The most successful hybrid learning will use a well-balanced combination of synchronous and asynchronous methods.

Mental well-being

Both teachers and students may experience a delay in their performance because of the psychological impacts of not having their peer group's physical support, being alone, having few books and other resources, feeling anxious and afraid about the epidemic, and using new teaching techniques. In order to create a safe virtual learning environment, which is vital for promoting learning, it is important for participants to be adaptable, helpful, and considerate of one another's needs. Regular online one-on-one coaching and postgraduate sessions can be helpful in this sense.

Assessment

It can be difficult to conduct a reliable and safe online assessment, but by using Proctorio and a Google Chrome extension, it is possible to monitor students taking tests online without violating their privacy. This is where regular formative reflective assessment on more manageable subjects might be helpful.

Quality check

It is a big challenge to improve and maintain the online course and high academic requirements. Finding and improving ways to polish the instructional plan may be beneficial in customizing departmental instruction by the use of program evaluative tools and regular feedbacks to assess the effectiveness of programs.

"A piece of coal that performed well under pressure is called a diamond."

Henry Kissinger

Absence of a defined plan or approach for the use of digital

New technology without any strategy can be a challenge. If a clear path and intended outcomes are not specified up front, it might be difficult for a large school to complete the vague task of completing a digital transformation because it is unclear how to achieve expected outcomes and goals.

Within an institution, this big size transformation can be unapproachable for many. The best success can be seen when a valid strategy can be made according to the school requirements and how to achieve them, the main ideas and actions they will concentrate on to accomplish this goal and by leading the educators and administrators forward.

An outline of the school's strategy for each student that includes:

What the school hopes to accomplish at the end of this digital transition, and why.

The school will take action to accomplish this goal:

Everyone will feel more at ease with the process and know what is expected of them during the journey with the support that the educators will provide throughout to help them make the changeover. Additionally, schools will get quantifiable goals that will enable them to track their progress as they undergo change. These guidelines can be used to ensure that the process stays on course and accomplishes the objectives you set out to accomplish.

Lack of understanding of the abilities required to accomplish significant digital adoption

Additionally, people need to possess the abilities needed to use technology efficiently and to confidently and professionally adjust to the digital revolution of the education sector. However, people in all industries and sectors face difficulties due to a lack of skills. A third of Americans have little to no digital abilities, and the majority of workers in the UK are not skilled enough to fill positions, which accounts for approximately 43% of STEM openings.

In other words, the skills gaps in the process to successfully transform educational institutions, remain an important consideration.

As a result, schools must make every effort to incorporate important learning opportunities into their plans for the digital transformation, as these will be crucial in enabling administrators and teachers to fully utilize the chances by setting up seminars and workshops. An environment where the institution values and expects ongoing learning should be established. Develop your technology abilities and assist educators in staying current and meeting the needs of today's students.

Unclear institutional data photos

Because there is so much information online regarding students, teachers, and the school as a whole, educational institutions don't have to worry about a lack of knowledge. Unfortunately, a lack of expertise is preventing many organizations from adequately integrating this abundance of data. Schools frequently compile data in silos. For instance, the marketing department might compile data on website traffic, while the admissions office might compile data on acceptance rates, degrees earned, and applications. However, the various departments are unable to combine their data into a single, locally relevant format. This failure puts the school at a disadvantage and impairs its ability to engage the student from their first visit to the website until the student receives their diploma. It also results in a lack of serious knowledge about the involvement of students in the institution as a whole, which affects potential users.

Decisions made by the institution on everything from marketing to class design without a comprehensive understanding of the school and students are made using erroneous and partial facts. Complete understanding of student’s interactions with the school can be gained by any digital transformation including breaking down these data silos. More enriching and rewarding education will be experienced for schools by this data and the available technology, so this critical data can be analyzed correctly by finding tools to enhance capabilities moving forward.

The capacity of current systems

Technology has already started to permeate the field of education during the past 20 years, and many educational institutions already had a range of tools and systems that they utilized to use some restricted kinds of technology. Many of these systems don't function well with one another because they weren't run as an integrated system, which results in a mismatched system throughout the institution.

Owing to the fragmented systems, schools are faced with the difficult choice of trying to employ fragmented systems or upgrading a significant portion of their equipment, which can be quite expensive. Regrettably, data silos are frequently the source of problems, which get worse when fragmented systems persist and increase the demand for system participation down the road. As a result, in order to improve compatibility and enable system interoperability, schools typically need to determine whether to upgrade or modify their current systems.

Lack of motivation/Isolation

Students find it challenging to stay focused in an entirely online setting; they cite, among other major obstacles, feelings of loneliness, boredom, a lack of capacity for self-organization, and a lack of time to keep up with the various courses (Liang et al., 2020; Mishra et al., 2020). According to the instructors, a major issue with course design was isolation. This highlights the need to strike the ideal balance between group projects and individual, student-centered learning,

and to create online communities of practice to enhance peer participation and student collaboration.

Digital Divide and Difficulties Resulting from Low Technical Proficiency

Since they sometimes had to quickly adjust to new online strategies with little to no teaching, the teachers felt that this forced digital transition was unpleasant. The abrupt conversion from in-person education to remote learning required a teaching staff that was not all that prepared to use different pedagogies that required specialized abilities (Marinoni et al., 2020). There are benefits to the digital divide for academics as well.

A generational divide may separate faculty members as all are not comfortable in an online setting, based on members who have never used technology tools and trusted on classical methods from the younger faculty who may be more comfortable with newer technologies (Govindarajan & Srivastava, 2020). The primary challenges highlighted by the instructors were the increasing need for specialized skills, such as the ability to communicate in an online environment, proficient computer knowledge, the necessity of solving particular problems rapidly, and the appropriate use of a variety of teaching-learning resources during class.

Nonetheless, following a brief period of adaptation and testing, the scholars emphasized some fascinating lessons for dismantling obstacles due to the quick conversion of remote instruction (Dwivedi et al., 2020). First, educators need to provide a suitable physical environment with lighting and audio for online instruction. The exact content of class sessions should be meticulously changed in order to modify the time of online lectures and to incorporate group activities that will engage, motivate, and inspire students for collaborative learning. Soon, the majority of universities will employ a hybrid model that combines online learning with small, in-person groups, and the academic community's main task will be to ensure that students in both scenarios receive excellent instruction (Dwivedi et al., 2020).

Financial Constraints of Institutions for new IT infrastructure

Universities also have other obstacles to this change, for example, financial constraints and the limits of the current IT infrastructure (Krishnamurthy, 2020). Public colleges will have to contend with shrinking budgets and a decline in student enrollment as a result of lower government funding because of the uncertain state of the economy. The universities' IT infrastructure will also restrict opportunities and demand certain investments in order to hold full digital transformation and improve these technical capabilities (García-Morales et al., 2021).

While digital tools are widely used in classrooms and by teachers, and digital education has long been a crucial topic across disciplines, educational administrations and schools have not been adequately prepared to take on the roles of leaders and change agents in the digital transformation. (For instance, when everything happened so quickly, touched everyone, and affected all educational levels. Children and their families were also greatly impacted by this shift since they were suddenly expected to possess a broad range of skills, resources, and competences.

In current COVID-19 situation, digital divides were maintained as unfortunately strong pictures were identified. Aside from that, there might be problems with children's, teachers', and parents' abilities and competencies to use tools, as well as problems with their ability to integrate digital tools into teaching practices in meaningful ways, learn from them, and reap their benefits.

Some kids reported that this digital transformation is truly benefit for them as they enjoyed practicing it, self-directed and personalized learning, be proficient of and advantage from liberated, while others anguish prominently from the existing situation of businesses due to the lack in all these respects and they missed out teaching overall. Additionally, some paternities stated being involved in their children's lives and being able to support them, while other parents claimed to be less capable of doing so. Research on digital learning has demonstrated that children rely significantly on their parents to engage in their education. Support from parents would have been essential during these trying times, but for various reasons, some parents might not have been able to provide it or might not have been present. Furthermore, it is now clear that instructors' digital competences and skills vary from one another. Again, in the challenging situation of the COVID-19, the teachers have showed great resilience, perseverance and creativity. These stakeholders could not report of embracing a practical attitude concerning digital technology and design and to meet the needs of digitalized basic education, innovative and better tools were designed. What is the meaning of the future of learning? Is learning online as effective? A changing education imperative/The reputation of distributing knowledge is emphasized through COVID-19

Research indicates that learning online can help students retain more material in less time, and that the changes brought on by the coronavirus may not go away. Some people are curious about the uptake of online learning, whether this abrupt move away from the classroom is still prevalent in many regions of the world after the pandemic, and how this will affect the global education industry. Prior to the COVID-19 pandemic, there had been significant advancements in the use of technology in education, with the worldwide edtech investment market reaching US$18.66 billion in 2019 and the inclusive online education industry predicted to reach $350 billion by 2022. Since COVID-19, there has been a noticeable increase in the use of online apps, including those for language learning, virtual tutoring, video conferencing, and video conferencing.

Some people think that the sudden and quick shift to online learning, which happened without any planning, with little training, and with inadequate bandwidth, will lead to a bad user experience that cannot support continuous growth, while others think that a new hybrid model of education that has substantial advantages will emerge. Aside from this, other colleges have already undergone successful transformations. For instance, in just two weeks following the change, Zhejiang University was able to provide over 5,000 courses online through "DingTalk ZJU." In 2020, Imperial College London launched the most registered course on Coursera, a course on the science of coronavirus. Professor Dr. Amjad of the University of Jordan, who has been utilizing Lark to interact with his pupils, says, "It has changed the way of teaching," as many have already proclaimed the benefits.

There is a proof that for people with access to the appropriate technology, learning can be more successful online in a variety of ways. The rationale for this is that students can learn 40–60% faster online, at their own pace, by skipping, returning to, or speeding through specific subjects, compared to typical classroom settings where learning takes place over a longer period of time.

Nonetheless, the efficacy of online learning differs throughout age groups as the overall. However, the effectiveness of online learning varies depending on the age group because, in general, a regulated environment is needed because children—especially younger ones—are more easily abstracted. The goal of this endeavor should be to enable "inclusion, personalization,

and intelligencemise on children" by including a range of collaborative tools and engagement tactics, rather than just using video capabilities to replicate a real classroom or lecture". In the meantime, research indicates that kids learn primarily via their senses, utilizing essential technology to make learning enjoyable and successful.

According to Mohit, it is evident that the epidemic has severely damaged the educational system, and many claims have already lost their applicability. Could this shift to online instruction be the impetus for developing a fresh and more efficient approach to teaching students? Some, however, fear that the quick development of online learning may have prevented them from achieving this aim, while others, having already reaped its advantages, intend to incorporate e-learning into their "new normal routine.

Significant global occurrences are essential for the quick development of e-learning, as demonstrated by the explosion of e-commerce during the SARS pandemic. However, since investments haven't dried up in one of the few areas, we have to wait and see if this e-learning will still be relevant after COVID-19. This epidemic has carried the significance of sharing knowledge across national boundaries, businesses, and all spheres of society. It is essential to investigate this online learning technology's full potential if it may be of any use here.

The coronavirus pandemic could change education

Millions of people worldwide have had their educational experiences altered by the coronavirus pandemic, and these innovative approaches to teaching may finally spark the much-needed innovation. The digital transformation of educational approaches has the potential to exacerbate inequality inequalities. The coronavirus (COVID-19) has changed the way that people learn in the world in a matter of weeks. This shift offers us a peek into the potential long-term changes to education, both positive and negative.

Patterns that may point changes in future

The researchers track three patterns that may point to changes in future. The patterns are:

Educational Transformation could lead to surprising innovations

Prior to COVID-19, nations continued to use antiquated classrooms, institutional biases that were deeply ingrained, and lecture-based teaching methods. The rate of change in academic institutions worldwide was appallingly sluggish. On the other hand, COVID-19 acts as a catalyst for educational establishments all around the world to provide creative solutions in a comparatively short amount of time. In response to this shift in technology, Hong Kong students are beginning to learn using interactive applications in an effort to stop the virus's spread. In China, live television broadcasts were accessed by 120 million Chinese to learn material.

When 5G technology is spreading throughout nations like the US, China, and Japan, learners and solution providers justly implementing the concept of digital education like 'learning anywhere, anytime' in a range of formats. New learning modalities are added to accompany traditional in-person classroom learning, from live broadcasts to 'educational influencers' to virtual reality experiences. Acquiring knowledge could turn into a genuine habit that is incorporated into everyday activities.

Partnerships in public-private education emphasize their significance

Learning groups and partnerships took shape after coronavirus with diverse stakeholders including governments, education professionals, technology providers, publishers, and telecom network operators that work together as a temporary solution to the crisis by utilizing digital platforms. But since the government has traditionally funded education in developing nations, this could become a prominent and pervasive trend in the field of education in the future.

Comparably, the Hong Kong forum readtogether.hk (China Daily video here) is a coalition of more than 60 educational institutions, professionals from the entertainment sector, publishers, and media that offers over 900 educational resources, such as book chapters, videos, free counseling services, and assessment tools. The group wants to keep the platform going long after COVID-19 has been contained. Even while the majority of efforts to date have been quite small-scale and narrowly focused, the pandemic may cover it at a bigger scale and through cross-industry collaborations centered around a shared educational objective.

The gap in digitalization can widen

The disparity in socioeconomic equality and the quality of education will widen across the board, barring a decline in access costs and an improvement in access quality. If access to the newest technologies is linked to educational opportunities, the digital divide may worsen.

Gloria Tam & Diana El-Azar, Minerva Project stated that:

"We need to incorporate resilience into our educational institutions".

The necessity of developing adaptability to deal with a variety of challenges, such as pandemic disease, climatic insecurity, rapid technological development, and extremist violence, has been emphasized by the speedy extent of COVID-19. In addition, the pandemic presents an opportunity for students to acquire new skills—like informed decision-making, flexibility, and creative problem-solving—that are necessary in this impulsive world. These abilities should be emphasized for all students, and resilience should be incorporated into our educational systems.

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