What COVID-19 has introduced into education: challenges
Facing Higher Education Institutions (HEIs)

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ABSTRACT
The effect of the latest novel Coronavirus (COVID-19) on higher education, specifically the transition from face-to-face sessions to online and interactive learning systems, is investigated in this study. The paper discusses the difficulties that higher education institutions face in transitioning to ‘online pedagogy,’ including mobility issues, technology connectivity, digital learning, and differential access to education. The key obstacles of a shift to distance learning during COVID-19, according to the findings, are technical resources and differential access to education. Though COVID-19 was challenging for students, it also served as a springboard for realistic alternatives such as artificial intelligence (AI), public-private educational collaborations, and digitalization. Universities should study policies to mitigate the detrimental effects of COVID-19, according to the findings, while maintaining a dedication to creativity and large-scale changes in practice.

Introduction

The novel Coronavirus, or COVID-19, has precipitated monumental changes to HEIs, higher learning institutions, forcing them to shift from traditional face-to-face learning to digital systems, including remote learning. As Coronavirus continues its spree globally, as part of their physical distancing policy. The WHO (2021) recommends physical distancing as a concrete safety precaution, as outbreaks have occurred in restaurants, offices, and classes (WHO, 2021), which is relevant for this discussion. The U.N. Educational, Scientific, and Cultural Organization (UNESCO) estimates that nearly 130 countries have closed educational institutions nationwide, and several have implemented regional or local closures. School closures have affected more than 80% of students, thereby spurring debate on the impact of lockdown on the education system (Lancker & Parolin, 2020). Researchers are worried about the long-term consequences of lockdown on academic happenings, learning, experience, and children’s overall development because online education cannot entirely replace all educational activities with the same efficacy.

With the advent of e-learning, academics face challenges in acquiring and implementing I.T. skills for teaching purposes. Though the matter has gained heft among educators, policymakers, and researchers, studies are comparatively less, particularly in the context
of Higher Education Institutions (HEIs). The researcher aims to explore the challenges that impact HEIs during their transition into online/distance learning because of COVID-19, contributing to an existing body of knowledge. Pulsipher (2020) notes COVID-19 ‘represents an immediate crisis for higher education, creating challenges for enrolled students and traditional institutions’ (Pulsipher, 2020). El-Azar and Nelson (2020) suggests that the disruption to traditional ways of teaching may be so high that Universities that view conventional teaching as a go-to strategy after COVID-19 may be unlikely to even survive. The authors say that higher education has a future in blended learning programs that include asynchronous and synchronous communication methodologies, experiential teaching and both in-person and digital instruction. Institutions failing to embrace the new changes may not survive (El-Azar & Nelson, 2020). Essentially, experts are saying that the changes precipitated by COVID-19 and restrictions, which have almost put an end to in-person instruction in some cases, may be permanent.

The paper is important because while it aims to reveal some of the fundamental problems associated with COVID-19 and restrictions, it also talks about some of the ways in which COVID-19 may develop new strategies for pedagogy, ones that are more in-line with the 21st century digital world. It positions technology as something positive.

The paper makes salient contributions to literature that already details the negative impacts COVID-19 has had on post-secondary learning and HEIs. Much of the discourse surrounding COVID-19 and HEIs/post-secondary education has been negative and mostly about the difficulties of such transitions to virtual learning. The following study delves into some of the new possibilities presented by COVID-19, which include the use of AI, public-private partnerships in education and increased digitalization. There are opportunities for students to build new skills and innovate with technology. Gupta (2017) notes some benefits of digital or e-learning include greater accommodation of personal needs, capacity to repeat lectures if needed, accessing updated/upgraded content, reduction in costs, scalability (transferability to new settings), as well as lower environmental impact (Gupta, 2017).

The paper aims to show how students transition into building lifelong skills, and how institutions offer students capacities in talent rather than skill learning.

The study is structured in the following way. It provides a narrative overview or review of literature related to COVID-19, beginning with challenges to pedagogy, real world cases and examples (including Africa, which has low internet adoption rates), possible future pathways and broader implications of moving HEIs to the digital sphere. The study aims to inform readers about the ways in which HEIs are adapting to COVID-19, while revealing new opportunities that may bridge global inequity gaps. The last part of the study details potential recommendations that would assist HEIs in making these difficult transitions into virtual/remote learning.

**Background of the study**

The unprecedented and rapidly evolving nature of the COVID-19 global pandemic has shifted many HEIs to the online world, precipitating large-scale changes that some HEIs have been unable to deal with, or have had a difficult time handling. The fact that HEIs
have newly developed emergency systems to help them transition into online learning does not mean they are ready for such systems, nor does it mean they are effective.

While learner-centered education and online pedagogy has increased in scope within the past several decades, and especially since 2000, there are reasons for why HEIs continue to struggle. Zalat, Hamed, and Bolbol (2021) conducted a study on the perceptions of University medical staff at an Arabic post-secondary institution, finding that 36% of instructors had inadequate facilities and equipment, while 40% did not have proper internet connectivity. Technical problems were also common (Zalat et al., 2021). Younger instructors or those unfamiliar with technology may have a difficult time transitioning to e-learning. Coman, Țîru, Meseșan-Schmitz, Stanciu, and Bularca (2020) studied Romanian Universities and how they dealt with the transition to e-learning during COVID-19, finding that instructors had issues with adapting content to the online format, as well as technical problems with equipment (Coman et al., 2020). Issues in students included possible decreased motivation, feedback delays and learning obstacles (Coman et al., 2020).

**Emergency-based online content delivery to full-time online pedagogy**

Pedagogy refers to the best way to achieve learning. Successful pedagogy needs teachers to comprehend and decide the optimized way of delivering the course lectures to help students learn appropriately. E-learning requires altogether different pedagogy, especially in online assessment and individual and group interactions. E-learning is not just about stuffing the websites with information; it is also about developing new ICT skills as well (Islam, Beer, & Slack, 2015).

While many institutions have shifted to an emergency-based online system, it does not mean that they are prepared for an ‘online pedagogy’ in the long run. Many scholars have questioned if HEIs are well-prepared for the forthcoming digital era of learning. There is no conclusive answer to this question as of now, but there is no denying that ongoing physical isolation is impacting the academic workforce (Crawford et al., 2020).

Transforming to online teaching mechanisms, adopting a student-centered learning model and interactive sessions coupled with high chances of students’ distractions, call for an innovative pedagogy in HEIs, thereby putting faculty members in a difficult situation.

For the last decade, there has been a call to replace teacher-centered methods with learner-centered instructions (Moate & Cox, 2015). Learner-centered content delivery is multidimensional, non-linear, and happens in relation to social contexts. This learner-centered pedagogy revolves around a democratic approach, which enhances students’ active participation and self-direction but leaves room for student distraction.

Learner-centered pedagogy emerges from constructivist learning theory, making educators view education in relational and social spheres (Crawford et al., 2020). Power differentials between teachers and students get diffused, and educators intentionally create opportunities for students to share their experiences and participate in activities.

While online learning tools can facilitate interactive learning, it is challenging for educators to keep students engaged and reduce the scope of distraction and misuse of technology. With digital platforms, educators will have to design the content not to fill
the purpose of content delivery solely, but also to foster their creative thinking and implementing capabilities. It is a tremendous transformation and a challenge because an inclusive classroom is still an embryonic concept; current education approaches fall short of running student-centered classrooms (Modan, 2020).

The advent of digital platforms is expected to create an urgency for this modification in the education system. Still, it is hard to predict how these transformations will affect traditional institutions that were explicitly designed to bring researchers, students, and teachers in proximity. While technological advances can offer them to shift to online programs gradually, significant differences between face-to-face interactions and online content delivery need to be managed effectively. Cornard (2004), cited in Islam et al. (2015), highlighted four different areas of expertise for an online instructor: pedagogical, social, technical, and managerial. Cornard (2004) conducted a questionnaire, which highlighted significant concerns of academics (Islam et al., 2015):

- Loss of control over students
- Lack of concentration compared to the traditional mode
- Difficulty using online platforms
- Felt ‘left in the dark’ because they could not observe students

Migration from traditional or blended system to entirely virtual networks will not happen overnight. Lack of home office infrastructure and problems with the general skillset needed to design online virtual education are just a few issues.

An analysis of responses by higher education systems across the world reveals that many universities do not have the resources and academic capabilities to transition to an online delivery system. They are just adopting a short-term approach that might prove unviable in the long-run (Crawford et al., 2020).

**Methodology**

The study is a narrative review of literature detailing the challenges students and teachers have faced with HEIs transitioning into the online sphere. It will select and use relevant literature, primarily from academic databases and government/non-government, credible organizations. The study will first reveal findings in a results table, and then proceed to describe these findings, subsequently providing recommendations. The study opens discourse for future opportunities in research, as well as recommendations.

The following is a rationale for the literature review as a methodology. According to Western Sydney University (2017), literature reviews build knowledge in a field, convey important ideas and show readers new insights that apply to the real-world. They illuminate the direction that research takes in a subject (Western Sydney University, 2017). A literature review allows for appropriately engaging with and assessing key research within a given topic and can allow the researcher to familiarize himself/herself with the opinions of experts. It can assist the researcher in coming up with new questions for study (UNF, 2021). This is optimal for the research at hand because it will deal with uncovering relevant data and sources about COVID-19 and opportunities/challenges inherent in transitioning to e-learning for post-secondary instructors. The paper is also meant to provide an overview to readers, rather than serve as an experimental
methodology, meaning the reader should gain a surface-level understanding of a variety of factors, including challenges in online pedagogy, consequences, methods and impacts.

Results table

Challenges in online pedagogy
Shifting learning paradigms to online platforms has become a ‘new normal’ for schools and higher educational institutions. Nonetheless, the integration of technology into the educational system depends on a myriad of aspects. Other than basic technological features, including accessing technical infrastructure, the quality of the network, and computers’ availability, several subtle facets might facilitate or hamper teacher-student interaction via digital platforms. Previous studies have suggested that the successful incorporation of technology into education relies on the interaction between three key players: students, teachers, and technology.

Learning competencies
Teachers’ perspectives on teaching and teaching methodology have a colossal impact on teacher-student interaction. Suppose they view teaching as a means of knowledge exchange and employ a teacher-centered approach. In that case, they will communicate the information to students and use different assessment techniques to evaluate their grasp of knowledge or comprehension of data. If they see teaching as a means of conceptual change and use a student-centered approach by encouraging independent learning, they will prefer to facilitate debates, cross-questioning, discussion among students, and assessment forms to evaluate conceptual clarity.

Teachers’ competencies have a significant role in the successful transition from offline to digital mediums. As research has already highlighted negative impacts on students’ output and motivation, teachers must explore different interactive ways to engage students. They can also employ a mix of teacher and student-centric methods to assert the benefits of both approaches.

Resistance to change
Using an online medium for delivering education is optimal in the changing environment, but nobody can deny the possibilities of resistance to change. As per a study (which analyzed psychological factors affecting teachers’ ability to be a part of the change), teachers mentioned discomfort, doubts, worries, feelings of being lost, and moving towards something unusual. Shifting to technological means is not comfortable for all. Teachers, who are experienced enough and enjoy traditional ways of imparting education, might feel it difficult to adapt to the changes (Duraku & Hoxha, 2020). Resistance to change is a natural product of dealing with unfamiliar circumstances.
Field of study

The requirement of technical equipment varies from one field to another. Clinical medicine, veterinary studies, and several other disciplines need laboratory access; education in such areas cannot be replaced entirely by distance learning. Many creative areas as art, music, and design need required equipment and negatively affect students’ performance in work from home settings. A challenge is ensuring all necessary equipment.

Transition from degree-based to skill-based talent

Covid-19 has escalated several disruptive trends related to higher education. Online has become ‘increasingly mainstream’ after decades of its slow adoption in higher education spheres. Still, one of the most debilitating disruptions will be the fast-paced transition from degree-based to skill-based talent. The idea that a college degree automatically prepares students to join the workforce is already outdated. The coronavirus outbreak has dramatically increased the need for upskilling and mid-career reskilling.

These upskilling and reskilling programs must ensure smart learning, not just learning. With the survey highlighting that over a third of workers would need additional education if they lost their existing jobs, program design and instruction delivery challenges are not beyond imagination (Pulsipher, 2020). Even those who retain their jobs would need to learn new skills to adapt and integrate into the new normal.

There is no denying that these disruptions are powerful enough to facilitate innovation, which can lower cost for students and enhance the value of their degrees by aligning them with workforce imperatives. Still, the merits and demerits of these modifications depend on how a country or institution embraces the change. Universities must align their courses according to industry needs. It is challenging now, and the results depend on several aspects, including students’ learning behavior and quality of upskilling programs.

Consequences: real-world cases and examples

Gaps in educational attainment

There is no denying that COVID-19 has broadened inequalities concerning educational opportunities. While developed nations can easily plan to switch to virtual learning and pacify the pandemic’s adverse effects, the situation is not-so-easy for developing countries. Poor and emerging nations have a shortage of technological infrastructure, and their access to low-cost networking options is inadequate.

Statistics highlight that only 60% of the population is the world is online. While internet penetration is 95% in North America, it is only 39.3% in Africa (Internet World Stats, n.d.). As such, the transition to online classes can affect a large chunk of people because of their inaccessibility to expensive data plans and digital devices (World Economic Forum, 2020).

A regional survey analysis (Table 1, Table 2 and Table 3) has further exposed substantial differences between Africa and other countries.
Table 1.

Higher Education Pedagogy
Learner-centered approach
The collaborative environment of learning
Students taking ownership of their learning experiences

Source: (Moate & Cox, 2015)

Table 2. The following table briefly summarizes findings the paper will talk about in the subsequent.

| Category | Content | Implication |
|----------|---------|-------------|
| Challenges in Online Pedagogy | Learning Competencies – Teachers are finding new ways to deliver instruction | There are opportunities for combining student and teacher-centric methods |
| | Resistance to change – Difficulty in adapting to new situations | Difficult time rolling out skills-based programs |
| | Equipment issues mean students have a difficult time accessing certain pieces, such as music or art equipment | |
| | Moving from degree based to skills-based talent – No longer sufficient to have a degree to be productive labor force member | |
| Consequences; Real world cases and examples | Gaps in educational attainment – low internet adoption rates in developing countries, like Africa | Exacerbating inequality |
| | Less proficient students may have trouble dealing with changes | General nuisance and chaos in medical schools |
| | Medical students lose important collaborative experience; may be forced to relocate | Less international activity |
| | Restricted mobility | |
| | Risks that students will have lower output and achievement outcomes online | |
| Possible Future Pathways | Innovation in digitalization | New and interesting/engaging modes of teaching and learning; connected to 21st century global changes |
| | Public private educational partnerships | |
| Implications of Transition to Online | Artificial intelligence | Social-justice focused |
| | Individualized instructions | Adapted to economies of scale |
| | Personalized learning | Students receive more personalized instruction they find more engaging |
| | Economies of scale | |
| | Broadening global access | |
| | Cutting down on transportation and other costs | |

Table 3. Shifting patterns of face-to-face education to online learning.

| Region | Not affected | Classroom teaching replaced by distance teaching and learning | Teaching suspended but the institutions is developing solutions | Teaching cancelled |
|--------|--------------|-------------------------------------------------------------|---------------------------------------------------------------|-------------------|
| Africa | 3%           | 29%                                                         | 43%                                                           | 24%               |
| Americas | 3%          | 72%                                                         | 22%                                                           | 3%                |
| Asia & Pacific | 1%       | 60%                                                         | 36%                                                           | 3%                |
| Europe | Almost zero | 85%                                                         | 12%                                                           | 3%                |

Source: (International Association of Universities, 2020)

The table clearly shows significant differences between Africa and other continents concerning the adoption of virtual learning models. In Africa, the lack of access to technology has caused many universities to cancel their programs, as compared to other global regions. Universities in Africa have found it challenging to implement
alternatives to in-person learning, which has detrimental impacts courses (International Association of Universities, 2020).

The issue of inequality is also not restricted to Africa. It has created divisions among HEIs even if they are operating in the same geographical region. Approximately half of HEIs in the U.S., Europe, and the Asia Pacific have stated that COVID-19 has strengthened their community engagements. In contrast, the other half on the same continents have noted a weakening of community engagement. Inequalities are also not limited to a country or state; they equally hold at an individual level. Financially sound students have access to the most and highest quality resources, while students from low socio-economic backgrounds are likely to suffer the most.

**Impact on less-proficient students**

There is mounting evidence that online sessions hurt a critical group: the group of less proficient students who are in dire need of classroom teachers. A growing body of research has suggested that students with different learning levels and achievements fare well in the blended model. The online model does not replace traditional classes; it supplements the latter (The New York Times, 2018).

The scenario can be completely different in the fully online model because it can create more learning issues for less proficient students. In these sessions, students have more distractions that can affect their motivation and enthusiasm to learn further. The bottom line is that the outcomes of online classes vary from person to person. There might be no distinction for a few pupils, but for some, the in-person method is more beneficial. Still, students from the weakest academic backgrounds are likely to suffer from the negative impacts of e-learning, which is decidedly more impersonal (The New York Times, 2018).

**Impact on Students’ Learning and Training: A Case of Medical Students**

Several teaching hospitals in the U.K. have suspended internship and clerkship students from attending clinical attachments. The ongoing suspension in hospitals might become more aggressive if the situation continues unabated. It will reduce medical students’ exposure in specific specialties and cause a detrimental impact on their performance and competencies. It will also cause financial loss to students, as they might miss the opportunity to work outside the U.K. (Ahmed, Allaf, & Elghazaly, 2020).

The shifting of in-person classes with online equivalents has disrupted the collaborative environments in which a medical student needs to work. Cancellation of clerkships is a serious matter because it is crucial for skill acquisition and relationship building. The pandemic has curtailed students’ opportunities for personal development and the scope of participation in conference presentations.

**Effects on international mobility of learners**

The cross-border movement of students is a defining aspect of the global higher education landscape. There has been an average annual growth of 10% in international student mobility in the last two decades. Nearly 5 million students move to different nations every year for tertiary education; the organization for Economic Co-operation and
Development (OECD) has predicted that the numbers will rise to 8 million by 2025 (BizED, 2020). However, this trend has been severely affected by the current pandemic. A recent survey conducted by the Institute of International Education (IIE) has raised concerns about students’ mobility between the U.S. and China. Around 95% of HEIs in Europe and 91% in America have reported that their student mobility has been affected due to COVID-19 (International Association of Universities, 2020).

It has been suspected that the decreasing number of university partnerships with other nations can significantly affect the number of students studying abroad. The Trump administration had barred international students from the country if their respective institutions have moved to the only online curriculum; however, the rule was rescinded because several universities sued the Trump administration over this rule (Quintana, 2020). Still, there is no denying that chaos and confusion over international mobility persists, and the chances of students going abroad have been significantly affected.

**Impact on Students’ Health**

Learning and collaborating in online and virtual environments might not arrive naturally. Policymakers must think about balancing digital with screen-free activities. In recent times, education has become online, but parents and teachers are equally concerned about the physical and emotional health of students. A current government directive in India shortened the length and duration of online classes considering their impact on students’ overall health and well-being. Undoubtedly, online programs provide flexibility and ease to join classes from the comforts of home, but continuous classes are harmful to eyes, ears, and brains (Anand, 2020).

Sleep disorders are already burgeoning, and researchers are still exploring the harm screen time can cause students’ sleep and creativity. Prolonged classes can take a toll on students’ health, and they can suffer from watery eyes, headaches, and burning sensation. A senior eye surgeon from India has confirmed that daily screen time for hours can cause several issues because blood circulation becomes stagnant, and oxygen supply reduces. Computer Vision Syndrome, as it is known in medical terms, can become worse because students are likely to watch T.V. or mobile after their classes (Anand, 2020). Many students are continuing courses on smartphones than laptops, which can further worsen watery eyes and burning sensations.

**Impacts on academic output of students**

Online education has been growing at a fast pace in the past few decades. In 2011, more than 6,00,000 students took one or more courses online, and the percentage of online enrollments increased from 9.6% in 2002 to 32% (Internet World Stats, n.d.). This trend motivated researchers to explore the promises and pitfalls of the online medium of instructions and content delivery. The topic was explored from multiple angles and provided some conflicting yet useful insights.

Scholars have endorsed that achievement in online sessions can be affected by age, marital status, learning styles (audio vs. visual learning), and learners’ maturity levels. Evidence also suggests that cheating is four times more in online sessions than traditional
in-person classes. These factors affect reported differences between students’ achievements (Dr, 2015).

Scholars have raised several concerns, including the engagement of students and their concentration in the online mode of learning. Research has revealed that students earning B grade in in-person classes would have received C grade in online courses. Additionally, taking a course online is likely to reduce their GPA by 0.15 points. Students are more likely to drop out because of a lack of engagement and motivation (Bettinger & Loeb, 2017).

On the contrary, some studies have denied any significant difference in students’ performance between online and traditional models. Nonetheless, it is essential to mention that online students are more likely to cheat (in the unsupervised environment), which might affect the level of their assessment and provide unsatisfactory results. Low achievement reported in online classes might be due to technical malfunctions during the examination. This leads to lower output, because students have difficulty expressing themselves on examinations, and proving results.

Precisely, researchers are not unanimous about students’ output in online settings. COVID-19 can be seen as an opportunity to spur such research and provide insightful findings down the line.

Possible future pathways

Innovation in digitalization

Coronavirus has changed the whole orientation of education and learning in the world. While the most pressing concerns have been the digital divide, unequal access, and rising inequalities, one must also remember opportunities in innovation and a monumental shift in educational approaches.

Several academic institutions have been running with outmoded classrooms and lecture-based approaches for a long time, and COVID-19 can be seen as a catalyst for educational institutions to explore and imibe innovation via technological solutions. Examples from over the world have shown that HEIs are fast-pacing to find adequate answers to academic issues. For example, students in Hong Kong started home learning via interactive applications, and China facilitated approximately 120 million students’ access to learning material through live television broadcasts (World Economic Forum, 2020). Likewise, a school in Lebanon initiated online learning even for physical education. Google Meet platform was implemented in Georgia in a private school with 950 students. The analysis highlights that the transition was successful, and the experiences could be modelled in other countries (Basilaiia & Kvavadze, 2020). This indicates that there are emerging opportunities in digital communication, which facilitate a new kind of learning that may be useful for students in the future.

With the penetration of 5 G technologies in several countries, including China, the U.S., and Japan, the concept of learning anywhere and anytime is expected to grow. As of now, there are challenges because of a lack of infrastructure and digital capacity/equipment, but the crisis has paved the way for further research and innovation in 5 G technologies. Furthermore, it can demonstrate several enticing ways to successfully combine offline and online mediums in the coming years.
The crises have facilitated educational institutions to connect students worldwide via different means such as Zoom, Microsoft Teams, and interactive webinars. As of now, these changes seem uncomfortable, but there is a silver lining too. These initiatives will quicken the pace of research in advanced educational platforms and methodologies and have a lasting impact on innovation and digitization. It would reshape schooling and align it with the most effective technology channels.

**Public-private educational partnerships**

COVID-19 has provided an excellent opportunity for learning consortia and coalitions among diverse stakeholders, including educators, publishers, technology providers, and network operators. Two positives will be emerging out of this scenario. First, there will be increased trust and mutual relationships between citizens and their governments, particularly during a time when people are growing mistrustful of the government. Second, the free tech sector will play a notable role in developing new cloud-based online learning platforms to upgrade the existing infrastructure. In emerging nations, where government plays a substantial role in imparting education, public-private partnerships can become a new trend in the education sector.

An excellent example of such initiatives is readtogether.hk in Hong Kong, a consortium of more than 60 educational institutions, media, publishers, educators, providing over 900 educational assets such as books and videos for free (El-Azar & Nelson, 2020). The consortium intends to continue these services even after the restrictions with COVID-19 ease. Though these examples are few and isolated, good chances exist of beneficial partnerships in the next couple of years.

**Artificial intelligence**

The need to adopt new technologies in the current pandemic could encourage educators to use tools powered by artificial intelligence (A.I.). AI-enabled tools can help HEIs estimate class size, planning curricula, and allocating resources such as facilities and financial aid. It can also be used in student guidance, such as recommending courses and suggesting possible career paths. Traditionally, institutions use several factors, including GPA or attendance, to identify the risk level of students. Still, A.I. software systems can utilize more subtle information to assess student risks by determining their overall behavior (Pranam, 2019). Some software even incorporates data such as when a student stops going to the cafeteria for lunch.

Wollowski, Neller, and Boerkoel (2017) note there are opportunities for students to explore their own perceptions of ethics with AI. In one paper, authors talk about using real-world projects to introduce students to AI within academic and non-academic contexts. Lessons can be supplemented by intelligent agents, video lessons and digitalized tutors. It also means broadening experiences to include non-academic students (Wollowski et al., 2017). The implication is that the potential for AI to include a diverse range of learners, even from non-academic backgrounds, is massive. It also means the possibility of using AI chatbot tutors as replacement for face-to-face tutors, cutting down on transportation and service cost for students.
In remote learning, A.I. tools can help teachers forego repetitive and time-intensive tasks and help them concentrate on higher-value education work. These tools can also break down assignments into smaller components that are easily understandable. These systems are of much help for international students who have language barriers. The cutting-edge research in text translation can help teachers translate the content in students’ native tongue. Likewise, voice recognition tools can help teachers deliver lectures with stunning accuracy (Pranam, 2019).

The current time has made it an urgency to develop such systems, as they will help mitigate some of the negative consequences of online learning. Future research in A.I. systems and rapid deployment into the education sector can usher into an altogether transformative era marked by excellent efficiency and high productivity.

**Implications of migration from face-to-face teaching to digital learning**

Shifting from traditional to face-to-face to online models need universities to work on several aspects. These include (U.S. Department of Education, 2012):

- Individualized Instructions: based on the different academic level of students and their learning trajectory
- Personalized learning: developing students’ interest and motivation to fetch better learning outcomes
- Optimizing opportunities for economies of scale: by reuse of material and large-scale distribution
- Broadening access: reducing the cost of providing access to educational resources, particularly in remote areas
- Cutting down fixed costs: by utilizing home and community spaces in addition to school buildings

These paths suggest that educational institutions need to focus on benefits and cost strategies to optimize the merits of remote and online models. Merely developing the equivalent of existing teaching practices might not be sufficient, and there is a need to redesign core educational processes. Instructions should be tailored to individual needs and supported by feedback. These systems will be based on competency, wherein students will exhibit the desired level of mastery and show inclination in learning new skills.

The present crisis could lead to the following three scenarios in education:

- The emergence of technological innovations in response to the shift in students’ behavior
- The reluctance of students to join traditional courses after experiencing online education at a lower cost
- Alterations in job markets can encourage people to use their skills in similar profiles (for example, students form aviation and hospitality can apply in other patterns using related skills and knowledge
These changes would need universities to tackle situations by adopting a multi-pronged approach. Rather than merely initiating the migration of existing courses online, they must look at the possible combinations of the subject domain, technological affordance, and assessment approaches that can work best for a particular group of students.

Underserved students would need special attention, and the present scenario is not catering to their needs adequately. These students will need excellent access, adult supervision, technical aptitude, and independent learning skills for full engagement in online courses. To reduce the risk of dropping out of online programs, using online learning for credit recovery is a viable option that can be explored further.

Last but not least, educational institutions must engage in continuous research and development to fuel innovation. They must identify the barriers the slow down the adoption of online learning models and explore practical strategies to overcome those barriers.

**Conclusion, recommendation and future work**

The discussion presents a complete overview of the strengths and weaknesses of the current scenario. This study found that the main challenges that impact online learning in COVID19 situation are related to unequal access to education, technological infrastructure issues, mobility, as well as the need to adapt to new systems of learning/teaching. Poor and developing economies have substantially less access to low-cost infrastructure and networking options, making their transition to the online sphere more difficult. Some studies show that education can become inequitable for poorer-performing students, who require additional face-to-face assistance. Plagiarism and cheating also increases vastly under e-learning systems. Teachers must find new ways to deliver instruction, and some may be resistant to change. Students also may have a difficult time accessing important class-related equipment, such as musical instruments or art equipment. While the shift from degree-based to talent-based learning is a positive step in the right direction, it also means large-scale attitudinal and practical changes in implementation. There is also the risk that international activity in education will decrease as a result of the current scenario.

There is no denying that COVID-19 has made the education industry take surprising turns. These changes disrupt the general ‘comfort zone’ of teachers who have had practices solidly embedded in their pedagogical repertoire, and who have been teaching students in-person for a long time. Scholars are right in highlighting the negative consequences of this shift in the long run, but opportunities ahead should not be denied or ignored.

Some of the opportunities and examples provided here are also significant and are congruent with trends toward increased globalization and interconnectedness, while there are pushes toward cohesion. There are ways to engage a broad range of learners that no longer face geographical or proximal limitations. Dimitriadis, McCarthy, Sultana, and Blackmore (1998) note one of the challenges of the 21st century is aligning processes of globalization with nation states’ natural desire for social and ideological cohesion. Postmodernity and globalization are effectively channeled and mediated through education (Dimitriadis et al., 1998). E-learning offers opportunities for nation states to build themselves, as well as to potentially explore meaningful cultural connections with others. Market imperatives continue to drive post-secondary education, particularly with increased openness to international education, and e-learning can only serve as a bridge, rather than barrier, between different cultures, religions, ethnicities and nations.
Learning Management Systems or LMS have several benefits as noted by literature. They can adapt to changing circumstances, be delivered by instructors through mobile devices, and keep things efficient by having everything contained in a single online system (De Angelis, 2014). The paper discovered that there are inequalities in the delivery of online education, especially for areas of poverty and in Africa. With the correct infrastructure, e-learning can help permanently transition developing nations into the global technological framework and society, so that marginalized ethnic groups can participate in meaningful economic activities and social discourse.

The situation is chaotic because the shortcomings of online classes are more visible than the benefits. Over time, the right technological elements will be used to create a seamless mix of online and offline programs. It is time to embrace the change via collaboration and cooperation. The digital divide can be mitigated to a significant extent if developed nations, partner with developing and emerging countries in providing infrastructural and technical assistance. Succinctly, collaboration is the way of fighting the pandemic. If the world succeeds in collaborating, it will likely experience several positive changes in the years to come.

The current wave of isolation, work from home, and online education proffers an excellent opportunity amidst all odds. If exploited effectively, it will pave the way for altogether new educational models and approaches. Nonetheless, universities need to:

Explore security options for taking an examination from home

This would be necessary to combat plagiarism and cheating which, as literature indicates, is easier for students to do from home, on a computer, where plagiarism materials are easier to access Explore different time and schooling models. It may be necessary to examine how instructors can provide both synchronous and asynchronous communication and instructional methods to empower teachers to make the best use of technological advances. As current literature stands, teachers may have a difficult time implementing digital learning because of limitations on knowledge and capacity limits with infrastructure. This approach involves meaningfully integrating training, development and support programs to assist teachers in broad-range and more focused online activities.

They need to devise and implement the best strategies to reduce costs and leverage maximum benefits. Adequate interventions can reduce current concerns to a significant extent. It is high time that educators, government authorities, HEIs, and other stakeholders accept the situation and join hands to fetch the best out of the pandemic.

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