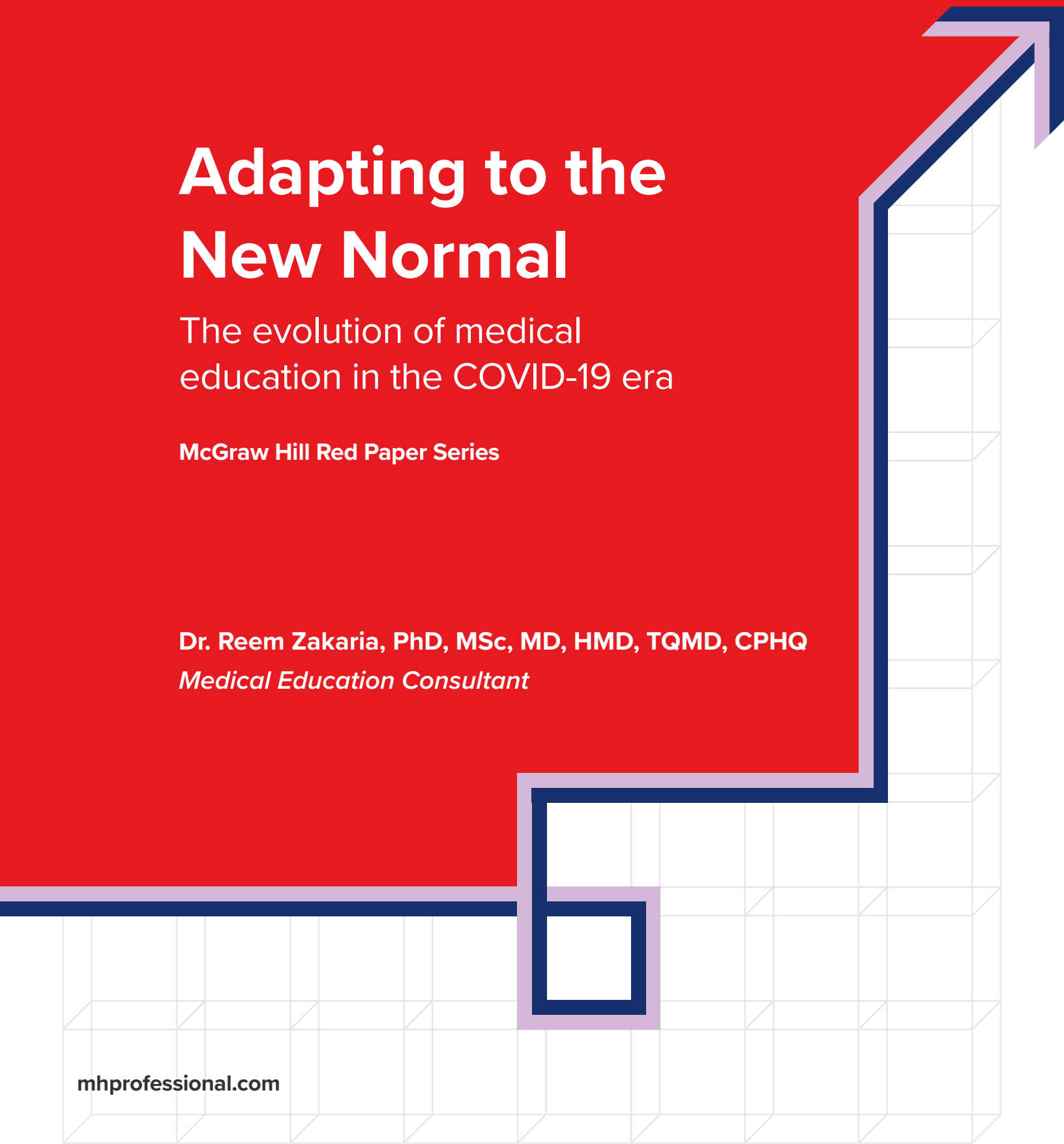# Adapting to the New Normal

The evolution of medical education in the COVID-19 era

McGraw Hill Red Paper Series

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The COVID-19 pandemic has had a significant impact on medical education, leading to major changes in the way medical students are taught and trained. This includes a shift to virtual learning and the use of technology, as well as a significant reduction in hands-on clinical training opportunities.

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ADAPTING TO THE NEW NORMAL – THE EVOLUTION OF MEDICAL EDUCATION IN THE COVID-19 ERA

The COVID-19 pandemic has had a profound impact on every aspect of society, including the way medical professionals are educated and trained. Medical education, which has traditionally been based on in-person lectures and hands-on clinical training, has had to adapt to the new reality of social distancing and remote learning. In this article, we will explore the major differences between medical education before and during the pandemic, and consider the implications for the future of healthcare.

1.1 COVID-19's Impact on Medical Education: Pre- vs. Pandemic Models

Medical education has faced reforms and changes through the situation of COVID-19. However, it is essential to understand how the medical educational system operated before coronavirus hit in March 2020. The experience of this pandemic introduced many challenges and provided opportunities for stakeholders in medical education to innovate.[1]

The COVID-19 pandemic has had a profound impact on medical education, leading to significant changes in the way medical students are taught and trained. In this section, we will compare medical education before and during the pandemic, highlighting the major differences and their implications for the future of healthcare.

Before COVID-19, medical education followed a fairly traditional model, with students attending in-person lectures and participating in hands-on training in clinical settings. This model had been in place for decades, and while there were some variations from one institution to another, the overall structure and content of medical education remained largely unchanged.[2]

One of the key features of pre-pandemic medical education was the emphasis on in-person instruction. Medical schools typically relied on a combination of lectures, seminars, and small group discussions to deliver course content and facilitate student learning. These in-person classes were typically held in physical classrooms or lecture halls, with students and instructors interacting face-to-face.[3]

In addition to in-person instruction, pre-pandemic medical education also included hands-on clinical training, which allowed students to gain practical experience in real-world settings. This clinical training typically took place in hospitals, clinics, and other healthcare facilities, and involved students working with patients under the supervision of experienced clinicians.[4]

During the COVID-19 pandemic, however, things changed dramatically. With the emergence of SARS-COV-2 and the rapid spread of the virus, in-person classes and clinical rotations were no longer possible or safe. As a result, medical schools and other healthcare education programs had to pivot to online learning and remote clinical training.[5]

One major difference between medical education before and during the pandemic was the shift to virtual learning and the use of technology. Medical schools were forced to move their lectures and seminars online, using platforms such as Zoom and Blackboard to deliver content and facilitate student interactions. While online learning has been around for a while, it was not the primary mode of instruction for most medical schools before the pandemic. The sudden transition to virtual learning presented a number of challenges, including technical issues, difficulties with student engagement, and the need to adapt to new teaching methods. This has required a significant

> " *Medical education faced challenges during COVID-19 with a shift to distance learning, with low-income countries facing more challenges such as financial limitations and lack of infrastructure, compared to high-income countries.* "

investment in technology and training, as well as the development of new teaching methods and materials.[6]

For example, many medical schools struggled to replicate the interactive, collaborative learning experiences of in-person classes online. Some students found it difficult to stay engaged and motivated during virtual lectures, and instructors had to find new ways to keep students involved and engaged. Additionally, the lack of in-person interaction posed challenges for student-faculty relationships and mentorship, as well as opportunities for networking and career development.[6]

Another major difference was the impact on clinical training. In pre-pandemic times, clinical training was a crucial component of medical education, allowing students to gain hands-on experience in real-world settings. During the pandemic, however, clinical training was significantly curtailed, with many hospitals and clinics limiting access to students and other non-essential personnel. This had a major impact on the training and development of medical students, who were unable to gain the same level of practical experience as they would have in a normal year.[7]

For example, some medical schools had to redesign their clinical training programs to incorporate remote or simulated learning experiences, such as virtual patient simulations or telemedicine rotations. While these alternatives can provide valuable learning opportunities, they are not a substitute for hands-on, in-person training, and students may not gain the same level of experience and skills as they would have in a normal year. Additionally, the disruption of clinical training may have consequences for the workforce, as fewer medical students are able
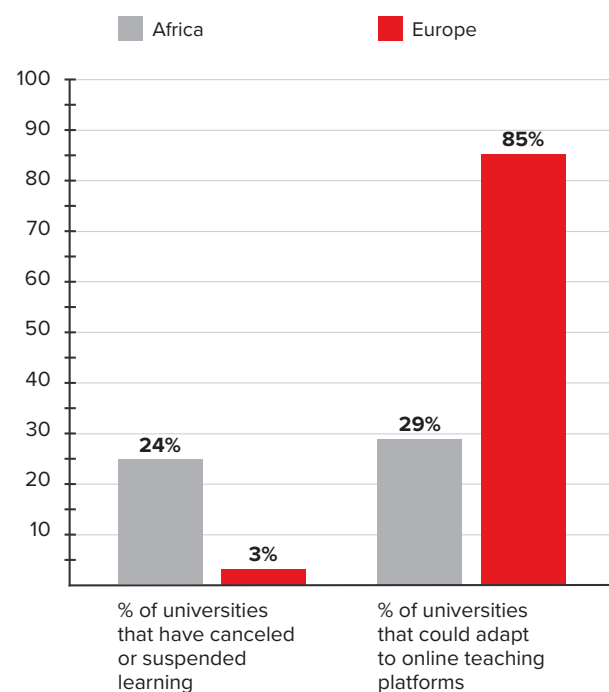
to complete their training on time and enter the workforce as fully qualified doctors.[7]

1.2 The Challenges Faced Due to The Situation of COVID-19

The huge transformation in the learning system from face-to-face system to distance learning for medical education during COVID-19 created serious challenges. Without a doubt, this situation differs between high-income countries (HICs) and low-income countries (LICs).

A study found that the COVID-19 challenges faced by medical schools in LICs were more exhausting compared to HICs. These challenges could be attributed to limited financial, lack of experienced personnel, and lack of infrastructure.[8] The International Association of Universities confirmed

Figure 1: Effects of COVID-19 on medical colleges in LICs and HICs, specifically Africa vs Europe.

Legend: Africa (grey), Europe (red)

% of universities that have canceled or suspended learning: Africa 24%, Europe 3%

% of universities that could adapt to online teaching platforms: Africa 29%, Europe 85%

the same information. This was executed by conducting a global survey to evaluate the effect of COVID-19 on medical colleges in LICs and HICs. The results found that 24% of African universities canceled or suspended learning continuation as there weren't any suitable alternatives, such as online learning. Conversely, only 3% of universities in Europe were affected in the same way by learning suspension. On the other hand, 29% of universities in Africa could rapidly adapt to online teaching platforms compared to 85% of colleges in Europe (**Figure 1**).[9] It should be noted that the challenges faced during COVID-19 for medical schools highlighted two perspectives: those of the student and those of the teacher.[8]

1.2.1 Medical Students' Perspective:

The outbreak of the COVID-19 pandemic brought unprecedented challenges to the medical community, including medical students. It disrupted medical education, created uncertainty about the future of the healthcare workforce, and posed risks to the physical and mental health of medical students.[8]

One major challenge faced by medical students was the disruption of their education. With the closure of universities and the shift to online learning, many medical students have struggled to adapt to the new learning environment. Some have reported difficulty accessing the necessary technology, while others have found it difficult to concentrate or retain information due to the distractions of being at home. In addition, the lack of hands-on learning opportunities has been a challenge for many students, as they have been unable to gain practical experience in a clinical setting.[10] Additionally, medical students struggled with a sense of detachment from their learning goals, particularly during times of quarantine, as well as difficulty with self-directed study and comprehension of their medical course material through remote learning methods.[11]

Another challenge faced by medical students was the uncertainty about the future of the healthcare workforce. Many students have expressed concerns about the impact of the pandemic on their job prospects, as well as potential job losses and layoffs in the health sector. Some have also

expressed fears about being deployed to the front lines of the pandemic without proper training or protective equipment.[12, 13]

The pandemic has also posed risks to the physical and mental health of medical students. The demands of medical education can be stressful even under normal circumstances, and the added stress of the pandemic has taken a toll on many students. Some have reported struggling with mental health issues such as anxiety and depression, while others have experienced physical symptoms such as fatigue and difficulty sleeping.[14]

Despite these challenges, medical students have also demonstrated resilience and adaptability in the face of the pandemic. Many have volunteered to assist with the response to the pandemic, including providing care to COVID-19 patients, distributing PPE, and conducting public health outreach. Some have even used the opportunity to advocate for change in the healthcare system, highlighting issues such as the need for improved telemedicine infrastructure and addressing inequities in healthcare.

1.2.2 Medical Instructors' Perspective:

The challenges during COVID-19 were very intense for instructors in medical colleges as they worked to complete the learning process for their students. The sudden shift to online learning and the restrictions on in-person gatherings have disrupted the traditional methods of teaching and learning, posing new obstacles for educators. Instructors were not prepared for the sudden crisis posed by COVID-19.[15]

One major challenge faced by medical instructors has been the transition to online learning. Many educators had to quickly adapt their teaching methods and course materials to a virtual environment, often with limited support or training. This has required a significant amount of time and effort, as well as a steep learning curve for many educators who may not be familiar with online teaching tools and platforms.[15]

Another challenge faced by medical educators was the restrictions on in-person gatherings. Many educators have had to cancel or postpone hands-on learning opportunities, such as laboratory sessions or clinical rotations, which are essential for medical education. The lack of these experiences can impact the quality

> *Despite the challenges, many medical instructors have continued to provide high-quality education to their students, often going above and beyond to ensure that their students have the resources and support they need to succeed.*

of medical education and may lead to a gap in knowledge and skills for students.

The pandemic has also created uncertainty about the future of medical education and the healthcare workforce. Some medical educators have expressed concerns about the impact of the pandemic on the demand for medical professionals, as well as the potential for job loss or furloughs in the healthcare industry. This uncertainty created additional stress for educators.[16]

In addition to the challenges faced by medical instructors and teachers, the pandemic also posed risks to their physical and mental health. The demands of medical education can be stressful even under normal circumstances, and the added stress of the pandemic has taken a toll on many educators. Some have reported struggling with mental health issues such as anxiety and depression, while others have experienced physical symptoms such as fatigue and difficulty sleeping.[14]

Despite these challenges, many medical instructors have continued to provide high-quality education to their students, often going above and beyond to ensure that their students have the resources and support they need to succeed. Some have even used the opportunity to innovate and explore new approaches to teaching and learning, such as using virtual simulations or incorporating experiential learning opportunities.
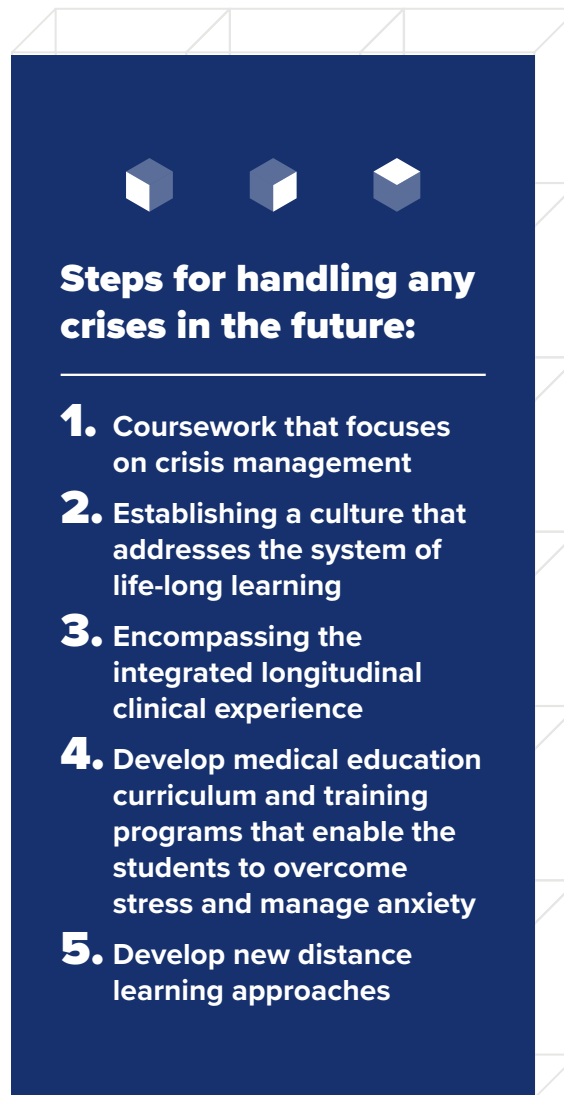
1.3 Opportunities of Medical Education After the Pandemic: The Role of Technology and Innovation

Although this outbreak alarmed medical colleges by abruptly introducing online teaching methods that created many challenges, it also provided many opportunities and broader horizons for medical education personnel.

Firstly, the use of technologies like virtual dissection tables, 3D anatomy atlases, and augmented virtual reality should be an integral part of medical learner's education.[17] Additionally, the use of virtual patient systems could provide enormous opportunities for medical students in their professional growth and skills development.[18] In addition, e-learning has improved the performance of medical students and increased their experience with using IT and educational applications. It also raised the faculty members' awareness regarding online teaching tools, which provide golden opportunities for both sides.[19] Furthermore, COVID-19 gave the

students and teachers the chance to learn the importance of documentation, monitoring, and controlling their learning.[8] One of the biggest opportunities incorporated during the pandemic is self-study for students and the improved technical side for professors.[20] It should be noted that the training opportunities performed by some medical students have great promise for their professional route. The frustrating situation of COVID-19 in hospitals led to staff shortages, which required medical trainees to serve patients. As revealed by a study conducted by Hamdard Institute of Medical Sciences and Research in India, online teaching methods can increase an institution's effectiveness and efficiency as students are capable of adopting the technology.[21] This moment in time can be used to drive positive changes in medical colleges, especially when it comes to encouraging personnel to maximize IT utilization. To achieve this, the development of soft skills for applying advanced learning tools is essential, due to neglect of such tools before the COVID-19 era. In light of learning methods post-COVID-19, a hybrid learning approach is considered to be an important teaching strategy in planning for the reformation of medical curriculum.[21] The experience of COVID-19 also boosts the need to monitor medical pedagogy content, course work, staff and students' technical skills, and innovations in the medical field that would benefit the wider community. Clearly, this opens a significant gate for research to form and plan best practice for digital applications in medical education, including innovative course delivery options.[4]

1.4 Preparing For the Future: Post-COVID-19 Medical Education Reforms and

Steps for handling any crises in the future:

1. **Coursework that focuses on crisis management**
2. **Establishing a culture that addresses the system of life-long learning**
3. **Encompassing the integrated longitudinal clinical experience**
4. **Develop medical education curriculum and training programs that enable the students to overcome stress and manage anxiety**
5. **Develop new distance learning approaches**

The educational approaches should be expanded by focusing on health elements/determinants: (behavioral, environmental, and social aspects).

Considerations

Considering the challenges faced by medical students and educators in the aftermath of the COVID-19 pandemic, it is imperative to examine certain aspects in greater detail. Furthermore, it is essential for the training and preparation of graduate medical educators to include plans for handling similar crises in the future.

The first step is to implement crisis and disaster management into the educators' coursework. In addition, it is crucial to establish a culture of life-long learning that factors in social health determinants.

This educational innovation will extend to the learning atmosphere by encompassing the integrated longitudinal clinical experience. Integrated longitudinal clinical experience (ILCE) refers to a type of educational program that combines classroom instruction with supervised clinical experience over an extended period of time. This approach to medical education is designed to provide students with a more comprehensive understanding of the healthcare field by giving them the opportunity to apply their knowledge in real-world settings and develop the clinical skills necessary to succeed as a healthcare professional. ILCE typically involves a mix of didactic instruction, simulated patients, and

hands-on training with real patients, which allows students to gain experience in a wide range of healthcare settings, such as hospitals, clinics, and community health centers. Therefore, this attempt will create an efficient learning environment that employs all available resources.[22] Subsequently, there is an essential need to develop medical education curriculum and training programs that enable students to overcome stress and manage anxiety during this outbreak or similar future outbreaks.[23] Obviously, the post-COVID-19 period should focus on developing new distance learning approaches, such as simulation facilities, technologies for extended reality (XR), and e-learning tools.[24]

To demonstrate, XR technologies and simulations provided an alternative to the direct clinical bedside. Augmented reality (AR), virtual reality (VR), and mixed reality (MR), all components of the extended reality technology, were virtually used under distance supervision by the teachers.[25] However, using e-learning modalities in the pre-COVID-19 era was not very common, especially for medical colleges; this could be due to the study of medicine requiring physical attendance.[26] However, the majority of faculty in medical universities were confident and enthusiastic about using e-learning as an alternative in the post-COVID-19 era. Therefore, in the future, medical universities should utilize the e-learning experience adopted during the pandemic and invest in more innovative tools. Undoubtedly, this should be done by creating comprehensive training programs so that students and teachers are equipped for any similar outbreak.[27] This could provide active, fair, and inclusive training programs to be used by the next generation of physicians. Learning consequences of the pandemic reveal that there were gaps and challenges within the medical curriculum that required modification.[28] Therefore, medical educators should make an appraisal of the current curriculum by using "The Bio-Medical Model of Health".[29] The bio-medical model of health focuses on identifying and treating medical illnesses and diseases through the use of scientific and medical knowledge. This approach views health and illness as biological phenomena that can be diagnosed and treated through the use of medical technology and interventions. It emphasizes the role of healthcare professionals in diagnosing and treating illness, and tends to focus on the individual rather than on social or

> **Medical education reform must address the issue of equity and diversity within the medical profession.**

environmental factors that may contribute to health and illness.[29] Moreover, the educational approaches should be expanded by focusing on health elements/determinants: (behavioral, environmental, and social aspects). One of the most important major issues that has been brought to light by the pandemic is the lack of emphasis on public health in medical education. Many medical schools prioritize training in specialized areas of medicine, such as surgery or oncology, over the basics of public health and epidemiology. As a result, many doctors are not fully equipped to handle outbreaks and pandemics. The COVID-19 pandemic has shown the need for medical professionals to have a strong foundation in public health, including knowledge of infectious diseases, epidemiology, and disaster preparedness.[30]

The COVID-19 pandemic has also highlighted the need for medical education to be more flexible and adaptable. The rapid spread of the virus and the emergence of new variants have required healthcare professionals to constantly update their knowledge and skills. Medical schools must teach students to be agile and adaptable, and provide them with the resources and support they need to stay updated with the latest research and developments.[31]

Another important aspect of medical education reform is the need to prioritize interdisciplinary collaboration. The COVID-19 pandemic has shown that no one discipline has all the answers, and that effective solutions often require the input and expertise of professionals from a variety of fields. Medical schools must do more to foster collaboration and teamwork among students from different disciplines, as well as prepare them to work with other professionals once they enter the workforce.[32]

Additionally, medical education reform must address the issue of equality and diversity within the medical profession. The COVID-19 pandemic has disproportionately affected marginalized communities, and it has become clear that there are significant disparities in access to healthcare. Medical schools must do more to recruit and support students from diverse backgrounds, and to teach students about cultural competency and how to address health inequities.[33]

1.5 The Importance of McGraw Hill Medical Platforms in Medical Education Revolution and Patient Care

McGraw Hill platforms, such as AccessMedicine, AccessSurgery, AccessPediatrics, etc., have revolutionized the way healthcare professionals access and share medical knowledge. These platforms provide an extensive collection of medical resources, including textbooks, journals, guidelines, and more, in a convenient and easily searchable online format.

One of the primary benefits of digital platforms is their ability to provide current and comprehensive information. Traditional print resources, such as textbooks, can quickly become outdated, as new research and treatments are constantly being developed. In the rapidly changing world of medicine, it is crucial for healthcare professionals to have access to up-to-date and accurate material in order to provide the best possible care to their patients. Digital platforms enable this.

Another advantage of digital platforms like AccessMedicine is their convenience. Rather than having to search through multiple books or journals to find the information they need, healthcare professionals can simply type a keyword into a search bar and access a wealth of information in seconds. Digital platforms also allow healthcare professionals to access resources from anywhere, at any time, as long as they have an internet connection. This is particularly useful for professionals working in remote or underserved areas, where access to traditional medical resources may be limited.

For example, a doctor in a rural area may not have access to the same number of medical journals as a doctor in a large city. With a digital platform like AccessMedicine, both doctors can access the same resources, ensuring that patients in all areas receive the same high level of care.

In addition to providing current, convenient, and accessible information, digital platforms such as AccessMedicine offer a range of multimedia resources, e.g. videos and animations, which can help healthcare professionals better understand complex concepts. These resources can be particularly beneficial for students and professionals who learn better through visual or interactive media.

In conclusion, digital platforms have revolutionized the way healthcare professionals access and share medical knowledge. These platforms provide relevant, valid, convenient, and comprehensive information, as well as a range of multimedia resources, which can help healthcare professionals better understand complex concepts and improve patient care.

McGraw Hill Access — COMPREHENSIVE INTERACTIVE RESOURCES

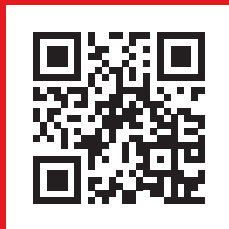|	
980+ Book Titles	**6,000+** Clinical Cases
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