E-learning of medical residents during COVID-19: perspective from a developing nation

The COVID-19 pandemic has globally disrupted medical education with the cancellation of lectures, exams, clerkships and ultimately the temporary closure of medical schools. Though the virtual world has come to the rescue, it requires intense and prompt attention from medical educators. The distinctive rise of electronic (e)-learning, a new hybrid model of education whereby teaching is undertaken remotely and on digital platforms, enabled the concept of 'learning anywhere, anytime'. As the overwhelming effects of COVID-19 may radically change how future physicians are educated, the key skill required to survive and thrive will be adaptability and psychological resilience in these new learning strategies.

A recent article by Iyengar *et al* titled 'Virtual postgraduate orthopedic practical examination: a pilot model' illustrates how e-learning and e-examination of medical residents can be planned and implemented in the current times.[1] The traditional didactic models of classroom sessions can easily be made into blended medical learning approaches where e-learning covers the theoretical and procedural training, and face-to-face training covers practical skills as required. In a flipped classroom model, students can spend as much time as they want on each lesson, thereby enhancing long-term learning. E-learning can offer highly effective learning environments, complementary interactive reinforcements that allow students to study and work at their own pace, from any location, at any time. As physical distancing is the most effective strategy to battle COVID-19 at present, societal benefits provided by this approach cannot be over-emphasised. Eventually, the traditional offline learning and e-learning can go hand in hand, even after the pandemic settles becoming the new normal.[2] Even e-exams can easily be inculcated as a routine practice once we have e-learning platforms established.

As communication and learning become increasingly virtual, medical residents have to focus on more digital learning methods and get adapted to 'virtual' classrooms, campuses, study groups, evaluation tools, office hours, whiteboards, learning environments to make the most of such sessions. Medical students are the future of medical practice and research with significant impact on society, the country and indeed the world. Medical education should not be hampered even in this time of crisis while ensuring proper precautions to keep students safe. This leaves e-learning as a practical and apropos solution. Medical educators will also need technical, policy and training support to transform traditional teaching and evaluation tools to online platforms within a very short period.

'The effect of electronic learning (e-learning) is likely to be revolutionary, although how precisely it will revamp professional education remains unknown' was the statement given by The Lancet Global Commissioners for the Education of Health Professionals for the 21st Century in 2010.[3] A decade later, through COVID-19, the potential of e-learning among various fields is being realised.

E-learning offers the possibility to quickly scale up training without the need for simultaneous resource-intensive infrastructure upscaling and the substantial investments and supporting medical staff can be diverted for other pandemic activities. As e-learning is adaptable and expandable, once implemented, the potential of e-learning could be revolutionary for training medical students in India.[4]

Skill development training including cognitive skills, procedural skills via simulation and team skills via group activities can also be imparted via e-modules. Although there are no randomised control trials comparing simulation and hands-on training, small studies have shown that simulation and e-learning can help develop skills, gain confidence, standardise the procedure and decrease complication rates later. Besides, simulation by e-learning can help to maintain the competence of an already acquired skill. Combining hands-on skill training along with e-sessions can help derive benefits of both along with reducing the occupational risk of COVID-19 in these pandemic times. Real-life hospital scenarios, like emergency rooms, operation theatres, physical examination methodology, ward rounds, are being recreated in simulated worlds using the state-of-the-art virtual reality technology.[5] Medical students can be trained for real-life scenarios over and over again, without exposing them to the risk of infection or risking a patient's life. Life-saving skills like cardiopulmonary resuscitation are taught using manikins and simulation under advanced cardiopulmonary life support training under the American Heart Association across the world. This simulation training can be made an essential part of postgraduate training and can be expanded to cover other components of the individual subject also.

CHALLENGES AND ROADBLOCKS IN INDIA—THE BC AND AD ERA

Subtle changes will be noticed in the preclinical undergraduates only as their curriculum is majorly classroom-based interactions. However, few preclinical skills like teaching/learning anatomy dissection virtually are unrealistic and impossible as the tactile element and real-world complexities of the body cannot yet be simulated satisfactorily.

Although new educational technologies have gained unprecedented momentum and are perceived as a panacea to combat all nuisances created, multilevel team-based learning, the art of eliciting a history, patient interviewing skills and physical examination skills cannot be effectively learnt through online methods. Without such lessons, these students will be left with incomplete knowledge and lower confidence when they have to deal with patients themselves. It is difficult to develop a curriculum that can closely replicate the experience of the operating room by e-learning strategies. As the future healthcare workforce depends on medical students progressing to residents and experienced doctors promptly, the difference will be obvious in comparing medical postgraduates of the BC (before corona) era and AD (after degree) era.

The basic concept and design of training and examination can be developed for all postgraduate students, and clinical keys can be added to medicine-based subjects and surgical skills simulation can form an integral part of surgical disciplines. An algorithm of training medicine residents along with their evaluation through e-exams has been suggested in figure 1.

CONCLUSION

Recovery from this pandemic will be a long haul, and only those who brace for change will thrive. As the world is going digital and our prowess in this space might well prove to be the determining factor for sustained progress in this pandemic. Medical education and indeed medicine as a profession was never designed to be fully online. However, Changes in Old teaching methods with the adaptation of Virtual Innovative methods for Doctors training **(COVID) e-learning strategy** (figure 1) is essential for tiding the COVID-19 crisis,

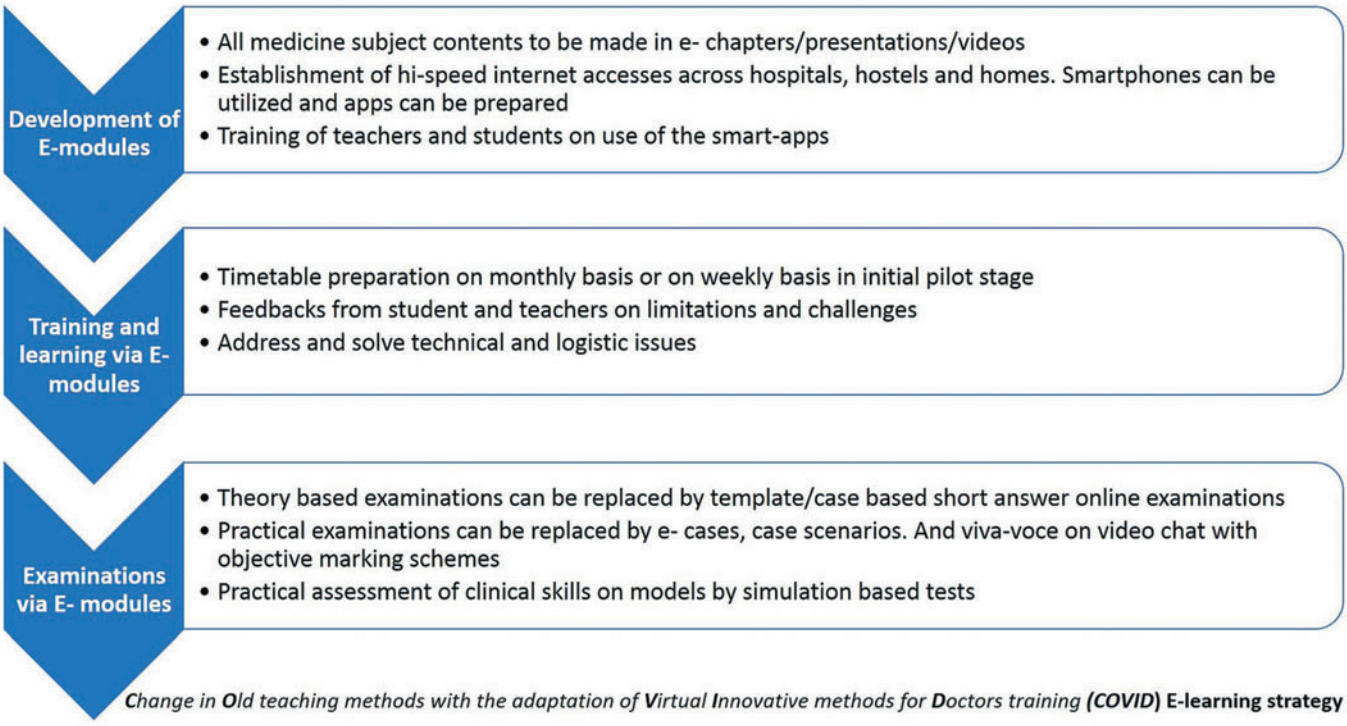

Figure 1 COVID e-learning strategy.

and e-learning should be integrated as a true lifestyle in the medical community worldwide.

Pranav Ish,[1] **Pirabu Sakthivel**,[2] **Nitesh Gupta**,[1] **Nipun Malhotra**,[1] **Madhu Rajeshwari**[3]

[1]Pulmonary, Critical Care and Sleep Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India
[2]Head and Neck Surgery and Oncology, All India Institute of Medical Sciences, New Delhi, India
[3]Pathology, All India Institute of Medical Sciences, New Delhi, India

Correspondence to Pirabu Sakthivel, Department of Otorhinolaryngology and Head-Neck Surgery, Teaching Block, All India Institute of Medical Sciences, New Delhi 110029, India; pirabusakthivel@gmail.com

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ORCID iDs
Pranav Ish http://orcid.org/0000-0003-1701-4970
Pirabu Sakthivel http://orcid.org/0000-0002-6941-9892

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