Lessons Learnt from Online Teaching of Clinical Skills

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On the 30th of January 2020, the Director-General, WHO, declared the novel coronavirus outbreak a public health emergency of international concern (PHEIC), WHO's highest level of alarm [1], as the death toll due to the COVID-19 started mounting all around the world. Since then, almost all affected countries have been forced to go under complete or partial shutdowns to contain the spread. Medical schools were among those affected and opted for online classes to teach the basic sciences, but this form of teaching has presented its own set of challenges. We explore some of the disadvantages as well as potential benefits of this form of medical teaching in general with special emphasis on teaching clinical skills.

Clinical skills: William Osler rightly said, "To study medicine without books is to sail an uncharted sea, while to study medicine only from books is not to go to sea at all." This applies to online learning as well.

Introduction to clinical skills is an essential component of learning even for the preclinical students. They learn the basics of clinical medicine and it also helps them to correlate and clinically integrate the other basic sciences they have been learning.

Videos are available for different maneuvers; it is also possible to display a live demonstration on mannikins, whenever feasible. The learning process, however, can be hampered by the fact that the students may not be able to practice those skills themselves. It is also difficult to adequately supervise, instruct, provide feedback, and correct the skills of the learner.

During this preclinical phase of their studies, they are introduced to clinical skills, laying the foundation over which to further develop their clinical acumen. If this stage of learning is being compromised, it will require more hard work and relearning of skills before they proceed to clinical rotations.

Technology: Many schools have implemented various virtual classroom platforms, the use of which has continued to evolve as per the needs of the teaching and the learning community. Even so, most students are used to traditional methods of learning. The role of technology in medical education in the past was often limited to creation and submission of assignments and exams. Abrupt forced use of an online platform has required a steep learning curve, which has been challenging for some learners and educators to negotiate. Older learners and faculty are more likely to suffer from technophobia. This can be mitigated to some extent by providing adequate training and technical support but can remain a source of anxiety and stress.

Even students who are confident and comfortable with technology might be limited by their home environments, for example the winter storm situation in US Southern states. Many students experienced issues like loss of connectivity and power. Students are then forced to depend on recorded lectures, losing out on the interactive component of learning.

It also raises the economic concerns of acquiring technology compatible with online platform use. Virtual proctoring of exams may necessitate additional devices which the student would not otherwise have procured.

Communication: Interactive sessions promote learning. It is possible to have such sessions online as well. In-person classes facilitate better sensitivity to the verbal and non-verbal cues. Current teaching software permit video-feed of the faculty, but while some students find that a space-occupying distraction, others feel it is still too impersonal and are not able to mentally engage as well as they would in an in-person class.

Rhim., *et al.* [2] talk of "transactional distance" in online learning as a social, psychological, and relational distance between teachers and learners. While physical distance is a barrier to traditional teaching, they argue that in online learning, the transactional distance can be reduced with meaningful interactions between the teachers and learners and a more flexible course structure. In fact, they point out that even in the traditional classroom, participants may experience a greater transactional distance without a dialogue between the teacher and students.

Outside of regular class lectures, additional office hours were available to provide additional help and guidance to students. They were encouraged to walk in for clarifying queries and concerns and such impromptu meetings were extremely helpful. Now these office hours are only accessible online, and meetings need to be scheduled in advance.

On the other hand, no one needs to be a 'back-bencher' in a virtual classroom. Students late to class do not disturb the rest of the class. Also, faculties teaching a new class for the first time would find it easier to note and address the students by their names (which are shown on screen). Otherwise 'shy' students may also find it easier to contribute and interact using 'chat' or talk especially when the video option is turned off.

Time zones: Medical students often come from different far-off states or countries. Some of them attend these online classes from home which are in different time zones. During the initial stages of transition to online classes sometimes there have been instances of students logging in at wrong times due to confusion regarding time.

While they soon learnt to negotiate the time conversions successfully, there remains the challenge of time difference. At times, especially during the morning classes, one may find students sitting up in a dark room, rubbing their eyes, trying to stay awake, because it is too early in their time zone.

Isolation vs distraction: The medical school environment is designed to be conducive to study, with facilities like library, support from faculty, mentors, peers, senior students and administration. Unfortunately, these resources are restricted in the online setting.

Some students may be living away from their family and feel isolated, more so in areas under severe pandemic restrictions. Higher levels of anxiety, exam stress and depression have been recorded among students.

Students living with family may have different set of challenges as they are required to take care of their family too. It is not unusual to have students whose toddlers or pets come running into their laps in the middle of a class. Some might be trying to work as well as study. Some may have family members affected by the pandemic, or they themselves might have been sick. All these issues can compromise their ability to get the most out of online classes.

Some of these issues can be addressed to some extent by combining synchronous and asynchronous e-learning [3]. Synchronous communication during live lectures can provide the social experience and support and make the student feel like a participant instead of an isolate. The asynchronous options allow learners to log on to the e-learning environment, like the learning management system, at their

own convenience and watch recorded lectures, participate in discussion boards, or work more thoughtfully on complex topics and assignments. The student has an extended opportunity to interact with the teacher and peers regardless of time or distance.

Despite these challenges, it is still better than not having any classes at all. This concept is not something novel, so many CMEs and online courses for medical professional have been in existence long before the pandemic started and are widely accepted. Despite limitations, they still impart useful learning. In 2008, Cook., *et al.* published a systematic review and meta-analysis of online versus offline learning which concluded that internet-based interventions had a positive impact on health professional learners [4]. However, this and a subsequent review by Richmond., *et al.* [5] compared the effects of online vs offline learning on licensed health care professionals only. In 2019, Pei., *et al.* designed a meta-analysis focused on undergraduate medical students alone and compared knowledge and skill outcomes between online interventions and offline learning [6].

Although the study was limited by the relatively small number of included studies (only 16 articles were analyzed), it concluded that while online learning was not necessarily more effective than offline learning, it was not less effective, regardless of the statistical method used for analysis.

As we enter another year of online classes, both the students and the educators have evolved and continue to adapt their strategies to derive maximal benefit from the online experience. Teachers could facilitate a more effective and meaningful online learning experience by considering the interactions of students with resources, instructors, and peers [7]. Teachers must create well organized lectures with clarity on learning objectives and relevant course content based on instructional design of learning materials. This will require substantial amount of time and effort but is crucial to providing a more effective learning experience. Designing more opportunities for interactions within the course for students with instructor and peers through regular feedback on assignments, online discussion forums, breakout rooms is essential to providing the students with the feeling of being part of a learning community. In this setting the instructor may not be the only knowledge provider, the students can learn by observing their peer students and by teaching others.

The COVID-19 pandemic may have forced the medical community to switch to online learning but with vaccines now available, there may be an opportunity to revert to the traditional learning methods, and yet incorporate the advantages and skills we have learnt from the online experience. There may be advantages to considering innovative educational strategies like blended learning in higher education [8] and other hybrid classroom initiatives.

Although, any new technology is exciting and holds great promise, implementation must carefully assess limitations and disadvantages. Having considered the challenges and drawbacks as well as potential solutions, we feel that it is time for medical educators to embrace online learning as a pedagogical tool along with the innovations that have been necessitated to transform our teaching approaches for the good of the students, patients, and society in general.

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