Dancing the Virtual Medical Tango in the Time of Covid-19

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Abstract

The response of medical schools to the Covid-19 pandemic is unprecedented. To protect students and patients, medical schools have suspended clinical attachments and bedside clinical teachings. The author reflects on how to engage medical students in virtual real time clinical encounters with the use of SMART technologies. As clinical teaching and learning of medical students will never be the same again, dancing this virtual medical tango in the time of Covid-19 and beyond may be a new norm.

Keywords: Clinical teaching and learning; SMART technology; virtual medical education; Covid-19

Introduction

Never has it been so silent in the outpatient teaching clinic. Never has it occurred in the past three decades since the start of my career as a paediatrician and a clinical teacher. The sound of silence has been there for almost four months, at times stolen by auditory hallucinations of tinnitus.

The response of medical schools to the Covid-19 pandemic is unprecedented. To protect students and patients, medical schools have suspended clinical attachments and bedside clinical teachings. These measures have reduced exposure of medical students to authentic clinical learning environments and posed challenges to those preparing for clinical examinations. The impact of social distancing and restricted patient encounters on clinical teaching and learning is immediately noticeable. I cannot help but ponder on ways to engage medical students in the clinical encounters. Can clinical teaching and learning be materialized through connections between the real and the virtual worlds?
Reflection

How should clinical medicine be learned? As Osler said, "Medicine is learned by the bedside and not in the classroom. Let not your concepts of the manifestations of disease come from words heard in the lecture room or read from the book. See, and then reason and compare and control. But see first. No two eyes see the same thing. No two mirrors give forth the same reflection. Let your word be your slave and not your master." (Stone, 1995).

Medical learners have to acquire the skills of history taking to obtain information for synthesizing the medical and psychosocial problems, conducting targeted physical examination to identify important signs, critical reflection to examine presumptions and query validity of arguments, and clinical reasoning for diagnostic decision making. An authentic clinical environment is instrumental to the completion of the loop of medical teaching and learning. In the time of the pandemic, medical learners are neither in the clinics nor by the bedside. For teachers, delivery of clinical teachings to remotely located medical students and, for learners, the need to interact directly with patients and teachers represent formidable challenges.

For delivery of preclinical teachings, medical schools have responded by creating web-based learning platforms and adopting the use of webinars and video conferencing platforms. Prior to the pandemic, online bedside and clinic teachings are almost unheard of. This is of course expected as demands are absent in the good old days. During this unrivalled crisis, clinical teachers are uploading lecture materials and prerecorded videos onto e-learning platforms and conducting tutorials through video conferencing platforms. Notwithstanding, the connection in real time of the different facets of clinical medical education is missing.

The most revered components of clinical teaching and learning remain to be face-to-face history taking followed by targeted physical examination of patients by the learners in an authentic clinical setting, with real time facilitation and feedback from teachers. As the saying goes, it takes two to tango. For the learners and teachers to dance the medical tango in a virtual context during the crisis, the clinical teaching and learning platforms in their present analogue forms are far from ideal.

It is cliché to say that we are living in a highly technological era. How to harness then the technologies to face the challenges of teaching and learning in clinical medicine? The internet-based technologies are now transitioning to disruptive SMART innovations that would lead the next revolution in not only the industrial but also medical healthcare sector. While my mind was wandering in the virtual wilderness, an iconic television character stood in front of me. It is none other than the Dr Leonard McCoy, who served on board Starship Enterprise and used almost without exception his tricorder to diagnose medical conditions of human and extraterrestrial origins. When he remarked "I'm not a magician, I'm just an old country doctor" (Gaither and Cavazos-Gaither, 1999), he was already using his hand-held non-invasive medical scanner that could perhaps be regarded as the prototype of SMART gadgets.

The SMART technology incorporates the use of portable and wearable connected devices, transmits information through the internet of things, and utilizes artificial intelligence and big data analysis to enable a level of cognitive awareness. The connection of people, provision of visual realities, and integration of information through a SMART platform can perhaps provide the link between the distantly located medical students and the clinical encounters. I became to realize after pondering that success of SMART connection between the learners and teacher depends on a mutually engaging environment, availability of appropriate devices, and readiness of the pair of medical tango dancers to adopt disruptive innovative technologies.

I decided then to combine the video conferencing platform with smart devices to engage the medical students in the clinical encounters in real time. The video conferencing platform has permitted face-to-face verbal and nonverbal communication among the medical student, the child and the parents. The student could try to build rapport with
them, clarify instantly the medical history, and explore patient or parental concerns though communications with eye contact.

For virtual physical examination, I wore a pair of smart glasses equipped with a video camera, which enabled the medical students to see from my visual perspective. The pair of smart glasses is capable of automatic focusing even at a close distance, which has enabled clear live transmission of examination maneuvers and physical signs including for example skin rash, cyanosis, finger clubbing, respiratory distress, cardiac pulsation, and abdominal distension. Through the pair of smart glasses, the medical students were further shown the blood counts, biochemistry, electrocardiogram, chest radiograph, and images of magnetic resonance and computed tomography scans. Not only could the students see what I could see, they could also hear what I heard in real time. Using a smart stethoscope, I recorded the heart sounds and murmurs with a wireless stethoscope as digital files, which were then uploaded immediately to the cloud server for sharing to the students.

During the final part of the virtual clinical encounters, we had reflective and interactive discussions through the video conferencing platform. During the discussion, many of the students gained parallel access to artificial intelligence powered web-based search tools to enrich their medical knowledge during discussion.

Upon reflection after dancing the medical tango with ninety-four students, it becomes obvious that the readiness of learners and teachers to incorporate innovative technologies in teaching and learning dictates the success of their adoption. Adoption of disruptive evolving technologies is an iterative process, which may be shaped by intergenerational differences. As Geoffrey Moore depicts in Crossing the Chasm, the most difficult step is making the transition between visionaries, the ‘early adopters’ who to me are more likely to young learners prepared to absorb new ideas, and the pragmatists, the ‘early majority’ (Moore, 2014). Am I a pragmatist? I believe that the incorporation of SMART technologies in these virtual clinical encounters has provided opportunities for intergenerational learning that has benefited the pair of medical tango dancers.

Aristotle said, "Educating the mind without educating the heart is no education at all." (Goodreads, Amazon.com, Inc). Completion of the teaching and learning loop is achieved by reflection from the heart and feedback between the pair of medical tango dancers. Connection is the key. Through dancing the virtual medical tango in this unprecedented crisis, I hoped that the medical student could see in real time what was seen by the teacher in the clinic, hear what was heard, feel what was felt, and concern what was concerned; and the teacher being able to talk the talk and walk the walk.

When and how will the pandemic end? The answer is unclear. What is clear, however, is the possible long lasting disruption of clinical medical education brought by the Covid-19 pandemic. Clinical teaching and learning of medical students will never be the same again. Dancing the virtual medical tango in the time of Covid-19 and even beyond may be a new norm.

**Take Home Messages**

- The Covid-19 pandemic has disrupted clinical medical education
- Medical students and teachers can dance the medical tango in a virtual context
- The SMART technology platform may provide the link between the remotely located students and clinical encounters.
Notes On Contributors

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Appendices

None.

Declarations

The author has declared that there are no conflicts of interest.

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Ethics Statement

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