Original Research Paper

Medical Education

AUGMENTING CBME CURRICULUM WITH ARTIFICIAL INTELLIGENCE COURSES – A FUTURISTIC APPROACH.

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ABSTRACT Artificial intelligence (AI) incorporated in the curriculum will promise for scientific development of students to keep pace with other modern fields like precision medicine. In the present scenario of COVID-19 pandemic, which has affected the healthcare delivery immensely, we rely on the physicians using AI based technology to assist in decision making and ultimately improved patient care in remote areas of the country. Since AI is technology of future; there are concerns that it may replace human workforce in healthcare industry. This article is an attempt to put forth perspectives on possibilities of dehumanisation of medical profession with use of AI and blending with CBME curriculum.

INTRODUCTION:

Medical Council of India (MCI) has launched a new brand of MBBS curriculum after a span of 21 years, "Competency-based UG Curriculum for the Indian Medical Graduates". This well documented; 890 pages in three volumes; curriculum was implemented in Medical Colleges across India since August 2019. The introduction of "Competency Based Medical Curriculum" (CBME) in medical education in India is to produce an Indian Medical Graduate (IMG), who remains the first contact physician with a holistic package of humane and scientific attributes. It is a special challenge for the faculty engaged in their education as to deal with high IQ medical students including their strengths and vulnerabilities. [1] Medical faculty rather insisting only on traditional teaching methods, should be capable to respond to the dynamic nature of learners by upgrading ongoing educational programs. Therefore, there is a need of identification and implementation of suitable strategies into teaching while engaging and keeping these students focused.[2]

"Artificial intelligence (AI) is a broad term that refers to algorithms that allow computers to perform tasks requiring human cognitive abilities."[3] To our belief AI incorporated in the curriculum will promise for scientific development of medical graduates keeping them updated with other modern fields like precision medicine.[4] In the present scenario of COVID-19 pandemic, which hit the health care delivery immensely, we rely on the physicians trained in AI to deliver teleconsultation in remote areas of the country and simultaneously practice social distancing. This is an example of how AI can turn out a boon for health care delivery at any point, if one is thoroughly trained in AI.

While discussion remains active on how AI could 'revolutionise' healthcare delivery, it is appropriate time to have cross talk and integration between other streams for new medical curriculum plan, which may include a medical-engineering collaboration. This view point allows us to answer AI challenges in medicine and augment skill of future medical practitioners. With the modification of curricula, the approach to hard science viz. mathematics and physics will be bridged, and there will be dimensional change for incorporating computational sciences, algorithmic coding and "mechatronic engineering". [4]

Although success while treating patients is encountered with the augmented medicine via telemedicine and teleconsultation, there is a certainty of resistance by healthcare professionals especially physicians due to multiple reasons. First, lack of basic evidence regarding this discipline leads to unpreparedness of digital medicine. Second, although the basic opinion in the literature suggests AI will be complementary to physician's intelligence in the future yet there is risk of AI replacing physicians. [4]

The Big question arise:

What If Ai Will Replace Doctors In Future?
Is Ai A Friend Or A Foe?

When today we are witnessing the COVID-19 pandemic outbreak, education sessions are largely suspended in most of the medical college to ensure social distancing. Also, medical teachers are compelled to maintain social distancing and utilise technology to deliver virtual classes and to complete semester syllabus. AI can be a boon in such scenario to deliver sessions. There is dearth of data on how many MCI registered medical teachers are trained in AI courses and how many among them actually use AI effectively. In future, untrained teachers in AI might lead to challenges in operating technological system due to lack of expertise and skills.

A Stitch In Time Saves Nine: Curriculum Reform And Restructuring

CBME curriculum is recently upgraded to determine and outline specific learning objectives to be accomplished by the students at the end of the course, and to achieve target domains viz knowledge, skill, attitude/professionalism and competency. Evaluations mainly involve formative assessment. Due to the academic burden on medical students it is pertinent to ascertain stressful experiences and coping mechanism adopted to adjust with degree programs and the changes in curricula. [5]

Besides CBME in medical education, AI based programs needs to be implemented including virtual classes and digital medicine which will target post-graduate medical professionals, imparting skilful training in AI. For few speciality medical streams, the major barriers for physicians to accept of AI based medical technologies is considered as risk of AI replacing physicians and dehumanization of their broad specialities. Also it would be challenging to manage increase in administrative work load to maintain computerized health records. But the fact is, it is a hyped statement that AI can completely replace doctor's role, on contrary it can only act as additional support medium. Few recent advances suggest use of Ambient Clinical Intelligence (ACI). ACI is progressive technology that is sensitive and adaptive. It provides a responsive digital environment in the working capacity of physician and attending patient, like analysing the interview and patient's electronic health records are filled automatically. However, with this modern technology of ACI and Natural Language processing, the clinicians will be able to focus more on the patient and will be sound to solve the non-clinical issues including administrative. [6]

The medical students would turn into medical expert:

A 100 years old tale of medicine suggests, an ideal physician will exhibit the remarkable characteristics to professional life and public life.[7] The phrase ideal doctor has identified 7 key roles as

"communicator, collaborator, manager, health advocate, scholar, professional, and the integrating role of medical expert". However, above roles meaningfully intersect for creation of the "Medical Expert". [8] Transformation to begin with novice and to shape into master in medicine is a slow process and certainly cannot be achieved hurriedly. Time with perseverance, experience and needless to mention, repetition is necessary for maturation. We get a fare idea to sensitize undergraduate students with AI by including in their syllabus and making AI based courses mandatory for postgraduate students. For example; they can be sent to engineering institute to collaborate for rotating posting as they do it during Compulsory Internship. A by-product of an augmented CBME curriculum will amplify the development of future generations of physician-scientists. [9] To be precise, after knowing the basic grounds of medical course, the essential function of virtual assistant will be played by AI tools in medicine.[10] AI tools will allow physicians help coping them to provide veracious and efficient patient care, and one can quote a typical example. For instance, technologies in the disciplines of radiology and pathology. [10] The main advantages would be, one, repetitive and time-consuming processes can be owned by AI leading to substantial reduction in the fatigue and exhaustion of healthcare providers, allowing physicians to practice Attitude, Ethics and Communication Manual (AETCOM) diligently and deal efficiently with more complicated medical tasks. Two, medical teachers will be able to act as technology driven facilitators and purpose of CBME would be enhanced. Three, involving AI courses in medical curriculum, future medical students will be able to gain expertise and experience to utilise AI based technology for better patient management. [3] Also this will provide an opportunity to integrate with their peers from engineering and allied streams and exchange certain concepts to improve patient care. Medical students should understand that preparing and learning AI methodology does not merely mean to learn basic computer programming, they will be empowered for applying their understanding for precision medicines and data sciences leading the practice of evidence-based medicine. [3] To accommodate the future educational needs sufficiently with the medical curricula which are still evolving, this is the current situation of pandemic which shows how important it is to provide dedicated AI based elective courses.[3]

CONCLUSION:

Implementing AI courses in medical curriculum will enhance use of latest technology to augment the CBME curriculum. Future Indian Medical Graduate should be empowered to develop competencies and skills to better patient management and utilise their expertise in AI. They should be able to get maximum advantage out of latest scientific developing technologies and should be able to contribute in recent advances in the era of digital medicine across the world.

REFERENCES:

1. Buja, L.M. Medical education today: all that glitters is not gold. BMC Med Educ 19, 110 (2019).
2. Bullen M, Morgan T. Digital learners not digital natives. La Cuestión Universitaria. 2011; 7:60–8.
3. Park SH, Do KH, Kim S, Park JH, Lim YS. What should medical students know about artificial intelligence in medicine? J Educ Eval Health Prof. 2019; 16:18.
4. Briganti G, Le Moine O. Artificial Intelligence in Medicine: Today and Tomorrow. Front Med (Lausanne). 2020; 7:27.
5. Applications and Challenges of Implementing Artificial Intelligence in Medical Education: Integrative Review. Kai Siang Chan, Nabil Zary. JMIR Med Educ. 2019 Jan-Jun; 5(1): e13930.
6. Acampora G, Cook DJ, Rashidi P, Vasilakos AV. A survey on ambient intelligence in health care. Proc IEEE Inst Elect Electron Eng. (2013) 101:2470– 94.
7. Keen WW. THE IDEAL PHYSICIAN. Journal of the American Medical Association. 1900;34(25):1592-4.
8. RCPSC. CanMEDS [Online]. Ottawa: College of Physicians and Surgeons of Canada.http://www.royalcollege.ca/rcsite/canmeds/canmeds-framework-e
9. Twenge JM. Generational changes and their impact in the classroom: teaching generation me. Med Educ. 2009; 43:398
10. Topol EJ. High-performance medicine: the convergence of human and artificial intelligence. Nat Med 2019;25: 44-56. https:// doi.org/10.1038/s41591-018-0300-7