



The Importance of Modification: An Imperative to Incorporate Machine Learning in Medical Education

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Dear Editor

Artificial intelligence (AI) is a scientific discipline which focuses on understanding and creating computer algorithms capable of performing tasks that are typically human features (1). AI has facilitated diagnosis, decision-making, data analysis, and management in medicine. It may also solve the shortage of physicians and access to healthcare services in remote areas (2). AI has progressed in natural language processing (NLP), decision-making management, machine learning (ML), deep learning, and robotic process automation. ML is a kind of AI that allows the systems to learn from data and develop self-learning algorithms. ML can understand the relationships between data without requiring predefined planning (3).

Based on previous studies, the interpretation of medical tests, including ECG, plain radiography, computed tomography (CT), and magnetic resonance imaging (MRI), is facilitated by AI and ML. The increase in research conducted on AI and the number of products receiving regulatory approvals over the past few years demonstrate the growing popularity of ML techniques in medicine. Regardless of the medical community awareness and medical education, ML is advancing rapidly. Unfortunately, even if based on the best evidence, the medical community is slow in accepting and applying changes or recommendations at

individual and systemic levels (4).

Medical education is like medicine in the mentioned process; thus, the learners are negatively affected, and patients will be the main losers (5). Many physicians continue to work without being able to acquire, analyze, and implement ML evidence, and learners may also be under the training of these doctors. Incorporating ML educational content into medical curricula may improve the quality of using ML in clinical practice. It allows current students and future clinicians to be not only competent in interacting with and critically evaluating ML algorithms but also active in the process of adopting ML in healthcare rather than acting as passive recipients (3).

Medical schools should consider training students by incorporating ML courses into the medical curriculum. Training the next generation of medical professionals with appropriate ML techniques may allow them to be part of this emerging science revolution. On the other hand, the inclusion of ML educational programs in medical education does not seem to be convenient; therefore, the lack of direct access to appropriate ML training for medical students is not surprising. Factors contributing to the lack of ML incorporation in medical education include, but are not limited to, the lack of accreditation requirements related to ML, and the lack of expert academic faculty members to instruct

the content (6). On the other hand, resistance to change makes it difficult to modify the medical curriculum. Lack of consensus on how to integrate change and an already crowded curriculum cause this resistance.

AI and ML affect both education and patient outcomes. The AI and ML incorporation in medicine has assisted healthcare professionals to improve the quality of care they can provide and continue to improve it even more shortly and beyond. AI and ML can revolutionize medicine and medical education. They will not put the health professionals out of business. Instead, they enable professionals to do their tasks better. Given the popularity and increasing usage of AI and ML in medicine and the need for doctors to be familiar with these concepts, it seems necessary to add the basics of ML to the medical curriculum (3).

Authors' Contribution

All authors contributed to the discussion, read and approved the manuscript and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately

investigated resolved.

Conflict of Interest

The authors declare no conflicts of interest.

References

1. Schinkel M, Paranjape K, Nannan Panday RS, Skyttberg N, Nanayakkara PWB. Clinical applications of artificial intelligence in sepsis: A narrative review. *Computers in biology and medicine*. 2019;115:103488.
2. Meskó B, Hetényi G, Gyórfy Z. Will artificial intelligence solve the human resource crisis in healthcare? *BMC health services research*. 2018;18(1):545.
3. Haug CJ, Drazen JM. Artificial Intelligence and Machine Learning in Clinical Medicine. *New England Journal of Medicine*. 2023;388(13):1201-8.
4. Morris ZS, Wooding S, Grant J. The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine*. 2011;104(12):510-20.
5. James CA, Wheelock KM, Woolliscroft JO. Machine Learning: The Next Paradigm Shift in Medical Education. *Academic Medicine: Journal of the Association of American Medical Colleges*. 2021;96(7):954-7.
6. Kolachalama VB, Garg PS. Machine learning and medical education. *NPJ digital medicine*. 2018;1:54.