Editorial

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Time for Self-upliftment – AI Tools as a Teaching-Learning Resource

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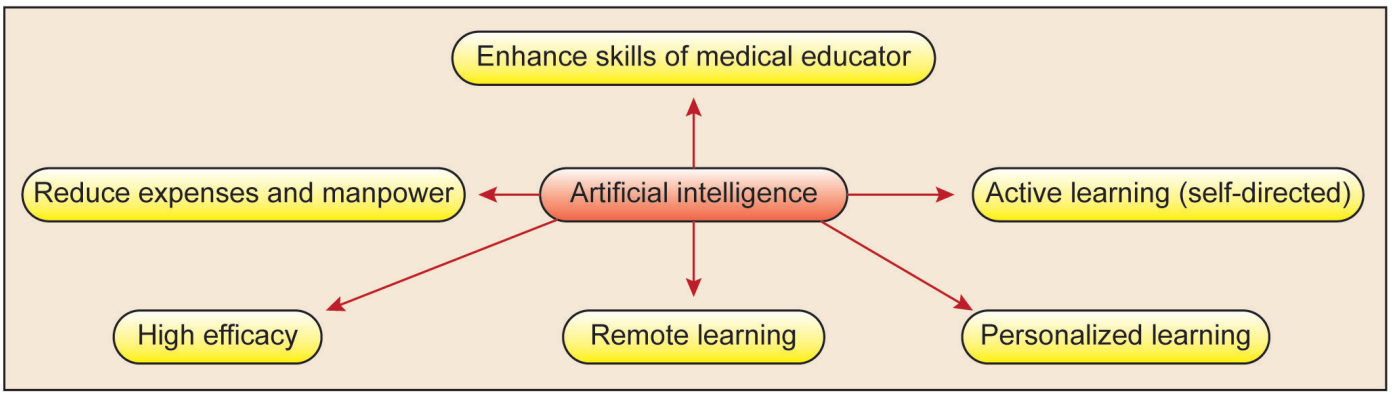
Medical education revolves around continuously developing science, including technology, new treatment modalities, new ways of communication, etc. With technical advancement, the main pillar of medical education, medical educators must uplift their skills and knowledge. The final output of their work depends on their mindset. In the last few years, the entire world has seen the rapid emergence of artificial intelligence (AI). Though the present era is mostly in the zone of narrow AI, the movement towards acquiring general artificial intelligence is in progress.

AI uses software-based computer algorithms that simulate human ways of thinking and decision-making. It uses and creates a vast database. Several medical institutions have started acquiring AI tools for teaching-learning modalities. There is a time-induced need for all medical teachers to self-uplift by learning and utilizing AI tools. Traditional chalk-and-board and PowerPoint-based teaching need to be shifted to an advanced method. More stress can be placed on self-directed learning and assignments, which can utilize the students' potential. Medical educators must learn AI tools before they are disseminated into teaching and learning methodologies. The cooperation of AI will enhance and facilitate active learning. AI has advantages in medical education, such as active learning, high efficacy, personalized, remote learning, reduced expenses and manpower, and so on (Flowchart 1).[1,2] The useful AI tools can be subcategorized into chatbots, virtual anatomy and virtual patients, gamification, intelligent tutoring, and adaptive learning systems (Flowchart 2).

Chatbot is an AI-based computer program that simulates human-like responses to questions through text or voice conversation. Chatbot utilizes natural language processing to understand the inputs and generate the responses. There are many chatbots available for use. Some of these are Chat GPT, Siri (developed by Apple), Alexa (developed by Amazon), Google Assistant (developed by Google for Android devices), Cortana (developed by Microsoft), Gemini (developed by Google), and so on.[3] chatbots are becoming more popular among medical students due to interactive capability. These chatbots can help in medical education by creating and solving assignments, easily searching the details of the topic and arranging the content in order, checking the solved digital assignment and refining the content, setting the reminders and as an administrative assistant, generation of new ideas and formation of workflow, etc. Medical educators can create PowerPoint slides, convert the content into specific-length bullet points, create various questions, create case scenarios, etc. The use of chatbots mainly depends on the input command. A proper and well-defined input prompt helps to get the desired output. The chatbots have specific limitations such as errors in generated outputs, which make it challenging to trust fully, lack of human feelings and empathy, questionable data privacy, limitation of knowledge, and lack

Flowchart 1: Utility of AI in medical education



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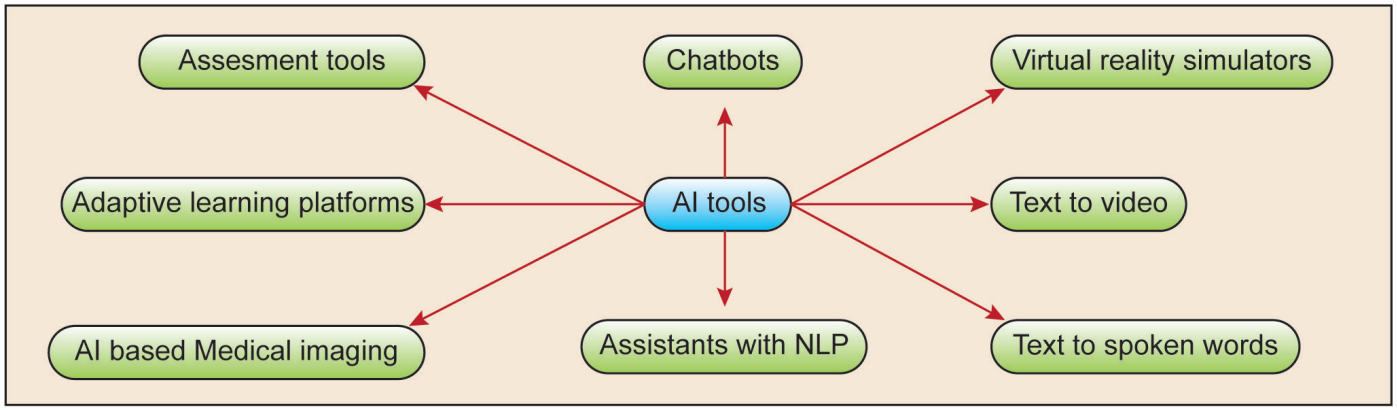
Flowchart 2: Artificial intelligence tools (NLP: natural language processing)



of inputs such as touch, temperature, taste, etc. Many chatbots do not support images and videos. In due course of time, some of these limitations may be overcome.

Adaptive learning platforms help create interactive and personalized learning for adaptive lessons and assessments and for developing online courses and quizzes. These platforms help analyze student performance data and formulate personalized advice for improvement and progress. A routinely used adaptive learning platform is Google Classroom. Other platforms are Smart Sparrow, Open Learning, CogBooks, Quizlet, etc. Google Classroom is free of cost to use. It can circulate study materials such as notes, images, and videos with the students or other collaborated teachers. It is helpful to collect feedback on assignments. Some limitations of adaptive learning platforms are limited customization, dependence on the internet, privacy concerns and limited personalized teacher-student interaction. Virtual reality models add an opportunity for the learner to practice the skills in a simulated environment.[4, 5]

Images and video editing is one of the essential components of modern-day teaching.[6] The AI tools have enhanced creativity and reduced the need for technical expertise, especially in photo- and video-editing. Good photographs and videos are integral to creating suitable learning resource material. Remove the background from the images using AI-integrated Adobe Photoshop or online removal.bg makes the images suitable for publication. Even a green screen background can be removed from the videos using the ultra-key effect of Adobe PremierPro. It can also be performed online using VidBG remover or many other platforms. A sophisticated studio is required to record audio and video. AI also reduces this need. Many software and applications are available for converting text into spoken words, such as Synthesia, Google text-to-speech, Speechelo, etc. This software uses AI to generate humanized voices and convert text into speech, which can be integrated with other videos easily. For video creation, AI helps use Avatar (artificial human). Software and applications such as InVideo, Synthesia, VeedIO, and so on can convert text into speaking Avatar. These videos can be used as learning resources.

Many free-to-use software are available, and most of them are still in the developing stages. With the advancement, more user-friendly software with less cost will be available in the upcoming days.

Take Home Message

Tapping the futuristic potential in clinical case scenarios

The under-utilized functions of ChatGPT should be highlighted which will revolutionize medical education sooner or later. It can create many detailed case vignettes that mirror real cases, from the symptoms to the diagnosis.[7] In the earlier versions, there were serious concerns regarding information accuracy and quality, making medical educators question the reliability of AI tools in developing authentic case scenarios. With the incorporation of large language models (LLMs), which have the inherent potential to learn from vast amounts of human-generated texts available on the internet, it is not impossible to integrate these tools in developing resources for clinical teaching. In addition, there are newer models such as Claude by Anthropic and Llama by Meta, which haven't been addressed in the medical research literature.

Need for incorporating AI skills into the curriculum?

In upcoming days, the AI skills find their place in the medical curriculum despite the inherent resistance by a few stakeholders. In that case, there must be clear working definitions to prevent misunderstandings. There are diverse ideas about its opportunities and potential limitations. But authentic learning won't take place unless there is carefully curated competencies. This must also consider the practical experiences, ethical considerations and nuanced understanding of its implications.[8] The lack of standardization in defining the above components may lead to academic uncertainty, which could pave the way for the potential rejection of a powerful tool into the curriculum. Hence, the medical educators, subject experts and curriculum experts should address this gap by pursuing implementation analysis and gauging the opportunities based on innate needs.

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