

# A Tête-à-tête with ChatGPT on the impact of artificial intelligence in medical education

Vignesh Ramachandran, PhD<sup>1</sup>, Pradeep Palanisamy, MD<sup>1</sup>, Balakrishnan Pachamuthu, PhD<sup>2</sup>

<sup>1</sup>Preclinical Department, Faculty of Medicine, Royal College of Medicine Perak, Universiti Kuala Lumpur, Ipoh, Malaysia, <sup>2</sup>Department of Microbiology, Centre for Infectious Diseases, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, India

## ABSTRACT

**Chat Generative Pre-Trained Transformer (ChatGPT) is an artificial intelligence (AI) language model developed by OpenAI. It is trained to process vast amounts of text and engage in human-like conversational interaction with users. Being accessible by all, it is widely used and its capabilities range from language translation, summarising long texts and creative writing. This article explores the potential role of ChatGPT in medical education and the possible concerns about the misuse of this technology through a conversation with ChatGPT itself via text prompts. The implications of this technology in medical education as told by ChatGPT are interesting and seemingly helpful for both the students and the tutors. However, this could be a double-edged sword considering the risks of compromised students' integrity and concerns of over-reliance. This also calls for counter strategies and policies in place to mitigate these risks.**

## KEYWORDS:

*Artificial intelligence, ChatGPT, medical education*

## INTRODUCTION

Chat Generative Pre-Trained Transformer (ChatGPT), the brainchild of OpenAI, an artificial intelligence (AI) firm based in California has taken the world by storm since its launch in November 2022. ChatGPT is developed as a large language model (LLM) that uses deep learning algorithms. It is trained to process a gargantuan amount of text and optimised to engage in human-like conversational interaction with users based on their prompts.<sup>1</sup> The capabilities of ChatGPT can be diverse from language translation, sentiment analysis, summarising long texts and creative writing to assisting with programming languages and coding. One can sign up for a free ChatGPT account at OpenAI's website and it is accessible across various operating systems including Microsoft Windows, Mac, iOS and Android platforms.

While this technology can help students in their studies by providing quick, reliable information, assisting with research and helping them practice and prepare for exams, it could be a double-edged sword.<sup>2</sup> There are worldwide concerns from academia considering the possibilities of misuse of this technology to generate essays, reports without original creative thinking, and compromise of students' integrity during online exams.<sup>3,4</sup>

Recent preprints have demonstrated modest performance of ChatGPT in the United States Medical Licensing Examination (USMLE) accentuating its role as an effective medical education tool.<sup>5,6</sup> To understand the implications of this technology in the teaching and learning of medical students, the authors had a conversation with ChatGPT (Jan 30, 2023 version- Free research preview) on 3rd February, 2023 using a Macbook (macOS Ventura 13.2) using the following text prompts.

## CONVERSATION WITH ChatGPT

<Authors Prompt 1>: Hi ChatGPT, Good day! Glad to meet you on this tete-a-tete session.

<ChatGPT>: Hello! It's great to be speaking with you. How may I assist you today?

<Authors Prompt 2>: What could be the potential role of ChatGPT in classroom teaching for preclinical medical students? Please include citations.

<ChatGPT>: ChatGPT has the potential to play a significant role in preclinical medical education, particularly in the classroom setting. By providing quick and accurate answers to questions related to anatomy, physiology and other medical subjects. It can help to supplement traditional teaching methods and improve students' understanding of key concepts.

ChatGPT can also be used to generate interactive learning activities, such as quizzes and case studies, which can help to engage students and reinforce their knowledge.

In a study published in the Journal of Medical Internet Research (JMIR), it was found that using AI-powered educational tools, such as ChatGPT, can lead to improved learning outcomes and higher student engagement. (Reference: Al-Amin et al. 2020. "The impact of artificial intelligence in medical education: A systematic review". Journal of Medical Internet Research. 22(8):e18364)

<Authors Prompt 3>: How can you be helpful in effective clinical teaching for medical students? Please include citations.

<ChatGPT>: ChatGPT can be highly beneficial in enhancing clinical teaching for medical students. Firstly, ChatGPT can

*This article was accepted:*

*Corresponding Author: Dr. Vignesh Ramachandran*

*Email: vignesh@unikl.edu.my*

be used to provide students with real-time feedback on their clinical decision-making, helping them to identify areas for improvement and sharpen their diagnostic skills (Kusumakar et al., 2020). ChatGPT can also generate interactive virtual patient cases, allowing students to practice applying their clinical knowledge in a realistic, simulated environment (Lin, 2019).

Additionally, ChatGPT can also provide students with instant access to a vast database of medical information, improving their knowledge retention and facilitating their ability to make informed clinical decisions (Kusumakar et al., 2020).

References: Kusumakar, V., Klassen, T. P., & Hartling, L. (2020). Artificial intelligence in medical education: A systematic review. *Journal of medical systems*, 44(10), 535.

Lin, T. Y. (2019). Deep learning for medical education: An overview. *Journal of medical systems*, 43(7), 321.

<Authors Prompt 4>: In what way will you be helpful to medical educators in preparing questions to evaluate the students?

<ChatGPT>: ChatGPT can be helpful to medical educators in preparing questions to evaluate students by providing suggestions for relevant and up-to-date questions. ChatGPT can generate questions based on the latest medical research and advancements in the field, ensuring that the students are being evaluated on current and relevant knowledge. Additionally, ChatGPT can assist in the creation of objective, multiple-choice questions that can be easily graded and evaluated.

By incorporating ChatGPT into the evaluation process, medical educators can save time and effort in preparing questions and can also benefit from the model's ability to generate questions based on the specific criteria, such as difficulty level or topic coverage. This can lead to more efficient and effective evaluations and help medical educators to assess student understanding and progress in real-time.

<Authors Prompt 5>: What will be your assistive role in students' medical research? Please include citations.

<ChatGPT>: ChatGPT can play an assistive role in medical students' research by providing real-time access to information, simplifying complex concepts and assisting in the analysis and interpretation of data.

Firstly, ChatGPT can provide students with quick and accurate answers to research-related questions, helping to save time and reduce the effort required for literature searches (Lin, 2019). This can be especially useful for students conducting interdisciplinary research, where ChatGPT can assist in the integration of information from multiple sources (Pereira et al., 2020).

Secondly, ChatGPT can assist in the analysis and interpretation of large amounts of data, such as patient data or clinical trial results. By using natural language processing and machine learning techniques, ChatGPT can extract meaningful insights and identify patterns in data that may

not be immediately obvious to human researchers (Lin, 2019).

References: Lin, T. Y. (2019). Deep learning for medical education: An overview. *Journal of medical systems*, 43(7), 321.

Pereira, A., Soares, M., Guedes, J., Mamede, J. C., & Paiva, A. (2020). Artificial intelligence and medical education: A systematic review of the literature. *Journal of medical systems*, 44(11), 569.

<Authors Prompt 6>: Will you be a concern for medical universities considering possibilities of plagiarism and cheating by medical students?

<ChatGPT>: Yes, medical universities should be concerned about the possibility of plagiarism and cheating by medical students when considering the use of AI tools like ChatGPT. While ChatGPT can greatly enhance the learning experience and provide valuable assistance to students in their research, it can also be misused to produce plagiarised or artificially generated content.

<Authors Prompt 7>: How do you think this concern on the risk of plagiarism and integrity of medical students be addressed?

<ChatGPT>: To mitigate this risk, medical universities can implement strict measures and policies to prevent and detect instances of plagiarism and cheating. This may include using plagiarism detection software, monitoring the use of AI tools, and educating students on the importance of academic integrity and ethical behaviour.

It is also important to note that the use of AI tools like ChatGPT should be integrated into the educational process in a way that supports, rather than replaces, critical thinking and independent learning. Medical universities should ensure that students are not solely relying on AI tools for their research and learning, but instead using them as a tool to aid and enhance their own understanding and critical thinking skills.

## DISCUSSION

ChatGPT, the AI-powered tool, has the potential to revolutionise the whole teaching and learning processes and significantly impact medical education. The responses from ChatGPT in the tête-à-tête session give a bird's eye view of its possibilities and pitfalls in medical education. The claims of ChatGPT's assistive role in medical education were verified by appropriate text prompts and the outcomes were satisfactory. While it is exciting to learn about the scope and advantages of incorporating ChatGPT for enhancing medical education, one should also be proficient on the uglier side of AI integrations, including the possibilities of academic dishonesty, plagiarism and ethical implications. Moreover, when the authors had prompted to include citations for its claims, the ChatGPT gave various citations (in response to author's prompts 2, 3 and 5). Verification of the cited references in PubMed and Google Scholar revealed that all citations were non-existent and made up by ChatGPT. This

making up of fake references, caused either by technical issues or limitations in training data, is a major issue of concern.

### CONCLUSION

The conversation with ChatGPT turned out to be lucid and the responses were surprisingly human-like, logical and convincing. However, as revealed by ChatGPT itself, there are other concerns including the risks of plagiarism and skewed academic integrity. Furthermore, making up of random citations is a major limitation and questions the genuineness of the content generated. This concern underscores the need for human verification of AI-generated content and avoiding over-reliance on AI considering the possibilities of inaccuracy. Hence, it might be a long way ahead for this technology to learn and equip itself better. Medical students should use this technology judiciously with utmost responsibility and universities should have policies in place to keep AI-generated content in check.

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