Letters to the Editor

Ensuring Equitable Use of Artificial Intelligence Mentorship Tools in Dermatology

To the Editor: We read the comments by Burke and Gwillim with great interest.[1] Recent advancements in artificial intelligence (AI) have resulted in increased applications in various areas of medicine, including mentorship and education. Although AI-based mentorship can mitigate time limitations of mentors, we must ensure that these mentorship models do not propagate harmful stereotypes. It remains vital for educators to ensure equitable use and access of these tools for all learners; biases in education lead to biases in practice.

There has been growing popularity within academic medicine of AI-assisted tools, such as ChatGPT, that may enhance learner experiences by addressing specific queries and synthesizing information into digestible formats.[2] These tools may enhance mentorship by providing real-time feedback and presenting trainees with a safe space to satisfy their curiosities. Yet, in order to provide learners with accurate training, researchers and educators must ensure that these tools are equitable; current AI models frequently assert falsehoods as factual,[2] and have been shown to perpetuate racial biases by promoting inaccurate and harmful race-based medicine.[3]

Given the visual nature of dermatology, many trainees hone their diagnostic skills via film slides and other image-based questions. Burke and Gwillim mentioned utilizing AI tools to offer guidance and feedback to trainees on image interpretation. While researchers aim to develop unbiased diagnostic AI tools, current state-of-the-art technologies have been shown to exhibit poor performance on skin of color and uncommon diseases.[4] There is already a well-described lack of sufficient skin of color education due to image scarcity of skin conditions in darker skin.[5] Incorporating inadequate technological tools without careful consideration can increase biases in trainees and exacerbate inequities.

Aside from performance and accuracy considerations of these new technologies, it is important to recognize potential barriers to access. Students without easy access to dermatology mentors, including those without dermatology programs in their medical schools, would benefit the most from these tools. Given the immense scale of these AI models, new advancements are frequently introduced by large academic institutions and well-funded private corporations that may not be incentivized to broadly share their work.[6] Researchers and educators should advocate for improved access for all trainees, especially for those with limited institutional resources.

Ultimately, we agree that AI tools will continue to play an increasing role in mentorship and education in dermatology. However, educators and learners must recognize both the potentials and pitfalls of these technologies and use these tools safely and judiciously.[6]

Funding/Support: None reported.

Other disclosures: None reported.

Ethical approval: Reported as not applicable.

Haiwen Gui
Fourth-year medical student, Stanford University School of Medicine, Stanford, California; email: hgui@stanford.edu; ORCID: https://orcid.org/0000-0003-0564-940X

Justin L. Jia, MS
Fourth-year medical student, Stanford University School of Medicine, Stanford, California; ORCID: https://orcid.org/0000-0003-4843-4548

First published online July 5, 2024

References

1 Burke OM, Gwillim EC. Integrating artificial intelligence-based mentorship tools in dermatology. Acad Med. 2024;99:e4. doi:10.1097/ACM.0000000000005705.
2 Boscardin CK, Gin B, Golde PB, Hauer KE. ChatGPT and generative artificial intelligence for medical education: potential impact and opportunity. Acad Med. 2024;99:22–27.
3 Omiye JA, Lester JC, Spichak S, Rotemberg V, Daneshjou R. Large language models propagate race-based medicine. NPJ Digit Med. 2023;6:195.
4 Daneshjou R, Vodrahalli K, Novoa RA, et al. Disparities in dermatology AI performance on a diverse, curated clinical image set. Sci Adv. 2022;8:eabq6147. doi:10.1126/sciadv.abq6147.
5 Syder NC, Omar D, McKenzie S, Brown-Korsah JB, Taylor SC, Elbuluk N. Gaps in medical education curricula on skin of color in medical school, residency, and beyond: part 1. J Am Acad Dermatol. 2023;89:885–892.
6 Gui H, Omiye JA, Chang CT, Daneshjou R. The promises and perils of foundation models in dermatology. J Invest Dermatol. 2024;144:1440–1448.

We Need to Add Prompt Engineering Education to Optimize Generative Artificial Intelligence in Medicine

To the Editor: Boscardin and colleagues[1] describe optimizing generative artificial intelligence (AI) use in several domains of medical education and close with a consideration of its real-world applications. As medical trainees who currently apply ChatGPT to automate documentation and facilitate clinical decision-making, we wish to underscore the importance of prompt engineering as an essential competency in the effective and safe use of ChatGPT and other large language models (LLMs).

Prompt engineering, the primary means of communicating with LLMs, is the process of creating inputs to generate precise and contextually relevant responses. Well-designed prompts can mean the difference between receiving a focused list of potential diagnoses ranked by likelihood versus a generic list of diagnoses that may not even apply to a given patient. Based on our own experiences, features of well-crafted prompts include clinically pertinent medical history and symptoms, references to the latest guidelines from professional medical associations, indications of the desired answer format and level of detail, and comments on ethical and legal guidelines. As the medical field continues to grapple with information overload, extracting relevant and concise information from AI has become a critical skillset.

Currently, most clinicians employ self-experimentation to understand the capabilities and limitations of these AI models. While this hands-on approach fosters technical proficiency and a deeper appreciation for the nuances of LLMs, the evolving landscape of medical education offers an opportunity for adapting prompt engineering as a key competency.

Introducing prompt engineering modules into our in medical school and postgraduate curricula would be a proactive step toward keeping pace with rapid technological advancements. Within 18 months of its introduction, ChatGPT's capabilities have expanded to include accessing real-time information and processing visual data. While GPT-4 with vision has been trialed with limited success in radiology,[2] other applications abound; we have reliably used it to generate graphics for diagnostic workflow and patient education purposes. Similarly, text-to-video generative AI models, such as OpenAI's Sora,[3] will enable the creation of videos to help patients comprehend health conditions, procedures, medication regimens, physical rehabilitation exercises, and more, all tailored to the patient's level of understanding and language preferences.

Indeed, clinicians—the individuals who will be creating, evaluating, and sharing the AI-generated content—are the limiting factor of whether, and how effectively, generative AI will be used in medicine. Though we are still the early days of these tools, in the face of their swift evolution, we believe the resilience and relevance of our medical training, and thus our health care system, are in significant part dependent on our ability to interface with them.

We urge stakeholders in medical education to prioritize the integration of prompt engineering training. By doing so, we can unlock the combined potential of AI and human expertise, paving the way for a brighter health care future.

Funding/Support: None reported.

Other disclosures: None reported.

Ethical approval: Reported as not applicable.

David J. Taylor Gonzalez, MD
Research fellow, Hamilton Eye Center, Memphis, Tennessee

Mak B. Djulbegovic, MD, MSc
Resident physician, Wills Eye Hospital, Philadelphia, Pennsylvania

Henry Bair, MD, MBA
Resident physician, Wills Eye Hospital, Philadelphia, Pennsylvania; email: hxb224@jefferson.edu; ORCID: https://orcid.org/0000-0002-3422-0373

First published online July 5, 2024

References

1 Boscardin CK, Gin B, Golde PB, Hauer KE. ChatGPT and generative artificial intelligence for medical education: potential impact and opportunity. Acad Med. 2024;99:22–27.
2 Deng J, Heybati K, Shammas-Toma M. When vision meets reality: exploring the clinical applicability of GPT-4 with vision. Clin Imaging. 2024;108:110101.
3 Open AI. Creating video from text: Sora is an AI model that can create realistic and imaginative scenes from text instructions. Published February 15, 2024. Accessed June 28, 2024. https://openai.com/sora.

Where Is the Content Expertise in the Clinician Educator Milestones?

To the Editor: Mahan and colleagues' article on the Clinician Educator Milestones (CEMs) describes an important framework for advancing the development of clinical educators.[1] As an early-career clinical educator, I read with particular interest about the educational theory and practice competency. I was struck by the lack of references to a teacher's understanding of their subject matter in this CEM, as well as the other 4. Where is the content expertise?

Research into teachers' professional knowledge has elucidated that effective educators have a deep understanding of instructional strategies *and* subject matter.[2,3] Content knowledge enables the development of analogies for elaborating important concepts, explanations for correcting learners' common misconceptions, and activities for facilitating clinical skill development in areas where learners may struggle.[2,3] This unique knowledge for teaching—termed pedagogical content knowledge (PCK)[2]—allows teachers to integrate their understanding of teaching strategies and subject matter as they enact instructional routines fit for the content, learners, and context.

The absence of content knowledge in the CEMs is understandable. Medical education experts previously asserted the importance of developing clinical teachers as educators rather than solely content experts, swinging the pendulum from content toward pedagogy.[4] Subsequent faculty development initiatives have necessarily focused on supporting teaching skill development.[5] Perhaps the pendulum can now settle in the middle.

The CEMs are poised to accelerate teaching skill development in medical education. It is worth bringing content knowledge along for the ride, too. As Lee Shulman, pioneer of PCK, said, we need to "pay as much attention to the content aspects of teaching as we have recently devoted to the elements of teaching process."[2]

Funding/Support: None reported.

Other disclosures: Dr. Penner receives financial compensation from the Clinical Problem Solvers for medical education work related to clinical reasoning.

Ethical approval: Reported as not applicable.

John C. Penner, MD
Assistant professor, Department of Medicine, San Francisco VA Medical Center, University of California, San Francisco, San Francisco, California; email: john.penner@ucsf.edu; ORCID: https://orcid.org/0000-0002-7021-9409

First published online July 5, 2024

References

1 Mahan JD, Kaczmarczyk JM, Miller Juve AK, et al. Clinician Educator Milestones: assessing and improving educators' skills. Acad Med. 2024;99:592–598.
2 Shulman LS. Those who understand: knowledge growth in teaching. Educ Res. 1986;15:4–14.
3 Irby DM. Excellence in clinical teaching: knowledge transformation and development required. Med Educ. 2014;48:776–784.
4 The Edinburgh Declaration. Med Educ. 1988; 22:481–481.
5 Irby DM, O'Sullivan PS. Developing and rewarding teachers as educators and scholars: remarkable progress and daunting challenges. Med Educ. 2018;52:58–67.

Certifying Organizations Should Promote Competency-Based Time-Variable Training

To the Editor: We applaud the article by Goldhamer and colleagues regarding the Promotion in Place (PIP) pilot program that operationalizes competency-based, time-variable training (CBTVT) in graduate medical education (GME).[1] At the University of Cincinnati internal medicine residency program, we, too, have a CBTVT pilot called Transitioning in Internal Medicine Education Leveraging Entrustment Scores Synthesis (TIMELESS),[2] with an intended implementation model similar to PIP's "sheltered independence."[1]

Our institution's credentialling committee granted a unique pathway wherein TIMELESS residents who are deemed ready by our clinical competency committee could be credentialled to practice without attending supervision within a limited scope of clinical