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RESEARCH LETTER

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Leveraging the efficiency and transparency of artificial intelligence-driven visual Chatbot through smart prompt learning concept

To the Editor:

With the advent of artificial intelligence (AI) technology's exponential growth, such as ChatGPT (OpenAI—Chat generative pretrained transformer), the incorporation of humanistic principles into education becomes critical to understanding the humanistic essence of medicine.[1] Other significant AI chatbots, such as Google Med-PaLM 2,[2] are also being explored for medical applications. In addition, AI chatbots like ChatGPT have shown promise in a variety of medical specialties, including radiology and allergy and immunology.[3,4]

A deep comprehension of the AI technology structure in medical education is crucial to appreciate the relevance of this integration. In recent years, the rapid rise of AI-driven chatbot applications in education has brought tremendous opportunities, but it also poses challenges.[5–7] While AI technologies can offer accurate results, as demonstrated by Hernández Montilla et al. (2023) in their study on the Automatic International Hidradenitis Suppurativa Severity Score System (AIHS4),[8] the essential role of human judgement and expertise should always be considered. These include a potential overreliance on AI-generated data, and a risk of undermining the irreplaceable value of human judgement and expertise.

In this letter, we explore the concept of '*Smart Prompt Learning*' concept within the AI visual chatbot platform, such as the Large Language and Visual Assistant (LLaVA),[9] emphasising the need for integrating humanities into education, providing a case study based on the Benner's Theory foundation model. This methodology through AI lens focuses on the importance of human decision-making and judgement, especially in complex case study where there may be some uncertainty or disagreement.[10] By using smart prompt learning in education, we hope to reduce too much reliance on AI-generated information, and enhance human expertise in decision-making and critical thinking.

For example, we used a visual ChatGPT assistant as the LLaVA to help diagnose a skin condition. We accessed the LLaVA interface (featuring the trained large multimodal model with default parameters) via https://llava.hliu.cc for the demo version using Microsoft Edge browser. When given a question and an image of a skin lesion about diagnosing a 48-year-old woman with itchy spots on her wrist provided in the Nursing in Practice,[11] the AI visual assistant can provide a diagnosis and percentage likelihood for each potential answer choice, with a prompt of '*How much percentage you correctly choose the following options?*' The virtual assistant said that '*The correct diagnosis, lichen planus, has a percentage chance of being chosen as: 100%. The other options, latex allergy, miliaria crystalline (heat rash) and shingles, have a lower probability of being chosen, with their respective percentages being: 0% (no chance), 0% (no chance) and 0% (no chance)*'. This scenario could lead to too much reliance on AI-generated information without considering human judgement and expertise, while the AI assistant provided the correct response, which matched the outcome of the quiz.[12] In the clinical practice, the AI-generated information might not always align with the realistic scenario that practitioner would encounter.

To address this overreliance constraint from the AI lens, we applied the concept of the smart prompt learning by looking at the perspectives of different levels of healthcare professionals knowledge and skills, as determined by Patricia Benner's Theory of Skill Acquisition.[13] When we asked the visual ChatGPT assistant for percentage values of each answer choice from the view of a *novice* nurse with a prompt of '*From the perspective of novice nurse determined from the Benner's Theory, please provide only percentage values for each answer choice*', it responded, '*From the perspective of a novice nurse, the most likely diagnosis chosen would be lichen planus, with a percentage chance of 75%. The other options, latex allergy, miliaria crystalline (heat rash) and shingles, would be chosen less frequently by a novice nurse, with their respective percentages being: 25%, 0%, 0% and 0%. According to Benner's theory, novice nurses are more likely to focus on the surface features of a patient's condition and may not have the experience to identify subtle nuances or consider alternative diagnoses. As a novice nurse gains experience and expertise through clinical practice and education, their diagnostic accuracy and ability to consider a wider range of possibilities will improve*'. This response considers the different levels of expertise among nurses in the practice.

As for the Expert nurse situation, the visual assistant provided the following answer: '*From the perspective of an expert nurse, as defined by Benner's theory, the most likely diagnosis chosen would be lichen planus, with a percentage chance of 30%. The other options, latex*

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allergy, miliaria crystalline (heat rash) and shingles, would be chosen less frequently, with their respective percentages being: 20%, 25%, 25% and 25%. An expert nurse has extensive knowledge and experience in their field and can identify and manage complex conditions with a high degree of accuracy. However, even expert nurses may not always agree on a diagnosis, as there can be some uncertainty or disagreement in certain cases, and a definitive diagnosis may require further testing or consultation with other healthcare professionals'. This shows that even Expert nurses may not achieve 100% accuracy in all options, and a final decision might need more testing or consultation with other healthcare professionals.

As Benner once stated, '*Experience, as it is understood and used in the acquisition of expertise, has a particular definition that should be clarified. As it is described in this model, experience is not the mere passage of time or longevity; it is the refinement of preconceived notions and theory by encountering many actual practical situations that add nuances or shades of differences to theory*'.[13] In this scenario, the expert nurse considers other possible diagnoses and additional evidence, which may not be available from the image alone, before making a final decision.

In summary, smart prompt learning based on humanistic essence is a helpful approach in education, as it reduces too much reliance on AI-generated information and supports person-centred decision-making and expertise judgement.[10] Through this case, we observed that smart prompt learning, by considering the perspectives of different levels of healthcare professionals based on Benner's Theory, highlights the importance of human judgement and expertise in medical decision-making. This method not only reduces the potential issues of relying too much on AI-generated information, but also promotes a team environment work where professionals can learn from AI visual chatbot tools while still maintaining their independence and critical thinking skills. Therefore, smart learning through the AI lens has the potential to improve the quality of care.

In the constantly evolving AI domain integrating into medical education, generative AI tools such as ChatGPT for the text-based analysis and LLaVA for both visual and text-based analysis offer a new horizon for learning and development in the clinical settings. However, it is crucial to remember the boundaries of AI-generated information and continue to know the value and importance of human expertise and knowledge in medical decision-making. The successful application of AI-assisted diagnosis in dermatology by Hernández Montilla et al. (2023)[8] underscores the need for a balance between technological advancements and human judgement. This balance is also evident in our case study where the LLaVA was used to diagnose a skin condition, further illustrating the relationship between AI and human expertise in medical decision-making. With the concept of the smart prompt learning, we can find a way to balance between using new technologies and preserving the essential role of human judgement in providing the best possible care for the patients in the practice.

CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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REFERENCES

1. Lee P, Bubeck S, Petro J. Benefits, limits, and risks of GPT-4 as an AI Chatbot for medicine. *N Engl J Med*. 2023;388:1233-1239.
2. Google. Introducing PaLM 2. Google. Accessed February 16, 2023. https://blog.google/technology/ai/google-palm-2-ai-large-language-model/
3. Lecler A, Duron L, Soyer P. Revolutionizing radiology with GPT-based models: current applications, future possibilities, and limitations of ChatGPT. *Diagn Interv Imaging*. 2023;104(6):269-274.
4. Goktas P, Karakaya G, Kalyoncu AF, Damadoglu E. Artificial intelligence chatbots in allergy and immunology practice: where have we been and where are we going? *J Allergy Clin Immunol Pract*. 2023;S2213-2198(23)00641-4. doi:10.1016/j.jaip.2023.05.042
5. Lee D, Yoon SN. Application of artificial intelligence-based technologies in the healthcare industry: opportunities and challenges. *Int J Environ Health Res*. 2021;18(1):271.
6. Alkhaqani AL. ChatGPT and nursing education: challenges and opportunities. *AJMS*. 2023;4:50-51.
7. Sallam M. ChatGPT utility in healthcare education, research, and practice: systematic review on the promising perspectives and valid concerns. *Healthcare (Basel)*. 2023;11(6):887.
8. Hernández Montilla I, Medela A, Mac Carthy T, et al. Automatic international hidradenitis suppurativa severity score system (AIHS4): a novel tool to assess the severity of hidradenitis suppurativa using artificial intelligence. *Skin Res Technol*. 2023;29:e13357.
9. Liu H, Li C, Wu Q, Lee YJ. *Visual Instruction Tuning*. Cornell University; 2023. arXiv preprint arXiv:2304.08485
10. Mhlanga D. Open AI in education, the responsible and ethical use of ChatGPT towards lifelong learning. SSRN; 2023.
11. Picture quiz: common skin presentations. Nursing in Practice; 2018. Accessed July 5, 2023. https://www.nursinginpractice.com/clinical/picture-quiz-common-skin-presentations/
12. Hisan UK, Amri MM. ChatGPT and medical education: a double-edged sword. *J Pedagog Educ Sci*. 2023;2:71-89.
13. Benner P. *From Novice to Expert: Excellence and Power in Clinical Nursing Practice*. Addison-Wesley; 1984:13-34.