

Reimagining the Role of a Medical Teacher in the Era of Artificial Intelligence

For the past three decades, the "Twelve Roles of the Medical Teacher" has been the key framework to determine the competencies required to be effective in the practice of medical teaching. It identifies twelve specific roles in six categories i.e. Information Provider, Role Model, Facilitator, Assessor, Planner, Resource Developer.¹ In Pakistan, it remains the key driver of almost all faculty development programs, including the short six-month Certificate in Health Professions Education (CHPE) and more comprehensive two-year Master in Health Professions Education (MHPE) programs. However, currently, there is a shift in Health Professions Education due to the rise of Generative Artificial Intelligence (AI) and the explosion of big data which raises the question: are these traditional roles still sufficient?

Contemporary literature clearly suggests that they are not.^{2,3} The pace at which medical knowledge expands today far exceeds the capacity of traditional teaching tools, such as textbooks. Thus, the role of the health professions educator is moving away from being a deliverer of information and toward becoming a developer of digital platforms curated according to learners' needs.

A common fallacy in our current educational practice is the assumption that incoming Generation Z medical students are inherently "digital natives" who require no instruction on how to use technology.⁴ While our students may be highly competent in utilising social media, literature evidence shows that they often lack professional digital fluency. They frequently struggle to critically evaluate the credibility of online information, detect algorithmic bias, and ethically use Large Language Models (LLMs).^{5,6} Thus, it would not be advisable to let students freely use these tools in their learning unguided. A medical teacher will be able to do this only when they are competent in ethically and effectively using these tools themselves.

As AI systems can synthesise complex diagnostic differentials and pass traditional assessments, our approach should not be to ban them or consider them as tools for cheating. Rather, we should teach medical students how to present clinical queries to Generative AI Models and interpret their output through humanistic clinical judgment.⁶

Evolution of Roles of Medical Teacher

Thus, the traditional framework of the competencies of a medical teacher needs to evolve. As clinical practice begins to use artificial intelligence and big data, the medical educator's job shifts from knowledge transmission to "Digital Stewardship". Building on the competencies presented in the "Twelve Roles of the Medical Teacher", this is how the six categories of competencies need to evolve.

From "Information Provider" to "Digital Information Curator"

Medical teachers today must be able to select and organise digital resources which can be used for training. They should be able to guide students regarding which websites and digital tools to use and appraise AI outputs. In the clinical years, they should be able to filter and prioritise data from patient history and examination and efficiently utilise AI tools in diagnosis and management.

To develop this competency, faculty training is required on Medical Databases (Medscape, UpToDate, etc.) and AI discovery engines (Consensus, Elicit, Research Rabbit, etc.). In addition, the focus of training should shift from basic keyword search to Boolean logic, semantic search, and structured prompt engineering. Sessions will also be required for the detection of algorithmic bias and hallucinations. Hands-on training on curated knowledge hubs (Notion, Gemini Notebook, Google Classrooms, etc.) will help them develop dynamic learning pathways for students rather than sharing static slides.

Institutions should use faculty with this competency to build digital learning banks comprising interactive modules, audio/video podcasts, clinical case scenarios, and flipped classroom packages that are peer-reviewed and vetted by the editorial boards within the Department of Medical Education.⁷ Cross-specialty and cross-institutional collaboration can be useful in developing integrated learning materials. Creating Communities of Practice with "Digital Champions" along with paired junior and senior faculty members can help achieve this goal.⁸

From "Role Model" to "Humanistic and Ethical Digital Role Model"

The transparent and ethical use of AI clinical decision support systems, considering algorithmic bias while ensuring patient data privacy, has become essential. As technology handles deeper analytical tasks, it must demonstrate humanistic features, such

as empathy, active listening, and shared decision-making.

To develop this competency, faculty will require high-tech efficiency alongside human-centredness, compassion, and care. For change in practice, institutions will need to develop policies, such as a "Digital code of Ethics" governing transparency, student and patient data privacy, intellectual property, and acceptable generative AI usage in clinical and educational workflows. Training in simulation centres should incorporate the use of Clinical Decision Support Systems at the bedside without compromising nonverbal empathy, eye contact, or active listening. Digital Ethics Symposia at universities and Digital Debriefs after ward-rounds can help develop a culture of digital transparency in practice.

From "Facilitator" to "Data Driven Mentor"

Predictive analytics from adaptive learning platforms and chatbots can be used to identify specific learner deficits. Thus, mentorship becomes targeted to the precise cognitive gaps of each student, ushering in the era of "Personalized Education".

To develop this competency, faculty training is required to navigate Learning Management Systems and use predictive analytics to identify and intervene proactively to generate data-supported action plans for the areas where each student requires support.⁹

From "Assessor" to "Analytics Evaluator"

Assessments need to shift from testing knowledge, skills, and attitudes to evaluating the enquiry process. These include the student's ability to prompt LLMs, triage options, and justify decisions. One way to do this is to introduce "AI-permissive" Objective Structured Clinical Examinations (OSCEs). In such stations, students are allowed to use clinical decision support systems or AI risk calculators for patient diagnosis and management. The examiner grades their ability to select the right tool, evaluate the output for hallucinations and use the information for patient counselling and treatment using standardised rubrics.¹⁰ In addition to episodic exams, medical teachers should be able to utilise continuous data from simulations and e-portfolios to evaluate both student competency and curriculum effectiveness.

From "Planner" to "Blended Ecosystem Architect"

The frequent use and effectiveness of Learning Management Systems (LMS) and Campus Management Systems (CMS) have moved planning from documents to live online digital platforms. Thus,

the digital planner should be able to use AI-based LMS to schedule and manage integrated teaching, map competencies, and identify redundancies. For teaching sessions, they should be able to plan and conduct hybrid learning environments that combine asynchronous microlearning with face-to-face clinical sessions. This makes training beyond the confines of time and premises of hospitals and/or college campuses possible.¹¹

From "Resource Developer" to "Digital Information Creator"

Use of generative AI to draft practice questions, clinical vignettes, and virtual patient scenarios is now becoming essential. To effectively do this, training in "prompt engineering for LLMs" is imperative. In addition, medical teachers must act as human-in-the-loop to validate accuracy and identify hallucinations.

In today's era of digitalisation, medical teachers of different medical institutions can collaborate and develop "Information Repositories" having curated interactive PDFs, audio, and video podcasts which can be accessed by students at large. Training and support from the Information Technology (IT) Departments of medical institutes will be necessary for such projects.

I believe these competencies will enable Medical Teachers to develop the doctors of tomorrow. Thus, it is the role of faculty training programs, such as the CHPE and MHPE, to develop these competencies in medical teachers so that they can produce a healthcare workforce having the ability to embrace and leverage technology for improved patient care.

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Dr Arsalan Manzoor Mughal

Associate Professor of Anatomy

Additional Director DME

Editor JRMC

Rawalpindi Medical University Pakistan

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