

Personalized Medical Education: An Innovative Approach for Training Future Physicians

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Dear Editor,

The "one-size-fits-all" approach to medical education is becoming increasingly inadequate for the modern learner. There are still considerable challenges to overcome, especially the volume of theoretical knowledge, the vital integration of theory and practice, and the considerable individual differences in attitudes, cultural factors, and the cognitive make-up of contemporary students, which have greatly undermined the efficacy of standardized teaching. Just as clinical medicine has progressively embraced personalization in diagnosis and therapy in recent decades, medical education must also accelerate its transition from time-based traditional models toward competency-based and personalized frameworks (1, 2). This letter outlines conceptual personalized medical education, its key elements, the influence of new technologies, challenges in its adoption, and its anticipated consequences on the education of physicians.

Personalized education stems from the works of John Dewey and other 20th-century educational theorists (3).

The essential components of personalized medical education include:

1) Assessing the student's needs and learning style: Systematic identification of strengths, weaknesses, learning styles, and learning patterns.

2) Flexible learning methods: Personalizing educational trajectories to align teaching objectives and

individual competencies.

3) Intelligent Educational Technologies: Incorporating artificial intelligence (AI) and adaptive learning systems that modify content and adjust instructional sequences based on several performance indicators in real-time.

4) Continuous Formative Evaluation: Over time, monitoring student advancement with successive modifications to ensure acquisition (1).

The most recent advancements in AI are geared toward personalizing learning in medical education. OSCEai shows how adaptive learning technology personalizes clinical assessments and exercises offered to learners at different levels (4, 5).

The immediacy of performance feedback, the constant availability of learning materials, and the adaptive learning paths are pivotal to educational advancement. Recent studies show that higher knowledge retention and improved learning outcomes respond to adaptive educational systems (6).

Implementation Challenges

There are pronounced barriers to personalized learning systems:

- Data privacy and security concerns.
- The digital divide and unequal access to technology.
- Risks of AI-generated inaccurate content.
- Lack of long-term outcome evaluations.
- The need for standardization of approaches and assessment methods (1, 7)

Regional Implementation and Context:

In the Middle East, since 2025, Dubai Medical College for Girls has introduced an educational competency model integrating portfolios and individual mentoring from the first year to provide continuous feedback and reflection, thereby engaging in self-reflection, fostering critical thinking, and overall professional growth (8).

Iran's medical education system experiences specific obstacles and challenges. Since the admissions gap has been increased by 50%, and without appropriate increments in the admissions infrastructure, the overworked clinical faculty has been stretched too thin, which has resulted in an overwhelming lack of clinical training opportunities. Coupled with the digital resource disparity between the capital's universities and peripheral educational centers, this presents a systemic problem (9-11). These problems point to the necessity for an educational value shift to innovation. A change to competency-based education in Iran can lead to paradigm shifts whereby clinicians can achieve competency within a variable-duration training program. To this end, we recommend that Iranian medical universities develop pilot programs to implement this approach. This would allow for evaluating its outcomes while accelerating the development of necessary infrastructure.

To develop flexible, critical, and competent clinicians who can respond to the clinical challenges of tomorrow, we prepare personalized medical education.

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