

## Viewpoint

## Entrepreneurship Education as a Strategic Lever for Transforming Medical Sciences Education

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## Introduction

Medical universities are traditionally structured to focus on clinical competence and biomedical expertise. However, contemporary health systems increasingly operate within complex innovation ecosystems that demand adaptive, opportunity-oriented, and value-creating professionals. Technical proficiency alone is insufficient. Health workforce sustainability now depends on cultivating entrepreneurial cognition, systems thinking, and problem-solving capacity [1, 2].

Globally, higher-education institutions are shifting toward knowledge-based and innovation-driven models. However, within medical science education, this transition has been uneven, especially in low- and middle-income contexts. In these settings, universities often emphasize content delivery rather than capability development, producing graduates who are scientifically competent but insufficiently equipped to translate knowledge into social or economic value. This persistent gap highlights the need for a structural reconsideration of the existing educational paradigm [3].

## The structural gap: Entrepreneurship as the missing dimension

Although discussions about innovation in health systems have expanded in recent years, entrepreneurship education remains poorly integrated into most medical curricula [4]. This gap is particularly evident in Iran, where medical training remains discipline-centered, examination-oriented, and clinically bounded. Consequently, the absence of structured entrepreneurial education has led to three interrelated challenges [5, 6]: Limited creativity and opportunity-recognition skills [7], weak university–industry linkages [8], and growing uncertainty among students regarding future career pathways [9].

Entrepreneurship education should not be interpreted narrowly as business training. Rather, it represents a pedagogical strategy for developing agency, resilience, and innovation-oriented professional identity. When embedded within health science education, it strengthens both employability and system responsiveness.

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## From pilot initiative to policy insight

At **Gonabad University of Medical Sciences**, a structured entrepreneurship education initiative provided a concrete example of how medical curricula can be reoriented to build innovation capacity. The program integrated foundational concepts in entrepreneurship, creativity development, and health-focused business modeling, while also introducing students to intellectual property literacy and project-based learning.

Through a competency-based and participatory approach that combined theoretical instruction with applied, student-led projects, the program reframed students not merely as future employees but as potential innovators and value creators within the health ecosystem.

The findings of this study indicated that contextualized, experiential entrepreneurship education can positively influence students' motivation, professional outlook, and engagement with real-world problem-solving. Effectiveness evaluation using internationally validated instruments demonstrated a 92% satisfaction rate regarding the relevance and quality of the course content, along with statistically significant improvements in creativity, risktaking propensity, self-efficacy, and entrepreneurial intention among participants. In addition, the initiative led to the establishment of two student technology cores and the registration of one national patent, providing tangible evidence of enhanced innovation capacity and sustained student engagement. These outcomes align with globally recognized models of impactful entrepreneurship education and illustrate how structured, experience-based learning can shift medical education from a theory-driven to a problem-based and innovation-oriented paradigm.

Thus, this initiative is not an isolated case but a scalable prototype that offers broader policy insights.

## Toward a paradigm shift in medical education

Institutionalizing entrepreneurship education requires more than adding a single elective course. This process requires a shift from:

1) Content-heavy curricula to competency-based design [10]; 2) Passive learning to experiential and project-based pedagogy [5, 11]; 3) Profession-bound identity formation to innovation-oriented professional development [12].

This transition aligns with broader global movements toward transformative education and workforce sustainability. It also supports progress toward Sustainable Development Goals related to quality education, decent work, and health system strengthening. Importantly, entrepreneurship education in medical sciences must remain socially responsive. Its objective is not commercialization for its own sake, but responsible innovation that enhances equity, accessibility, and system resilience.

## Strategic policy directions

To achieve sustainable integration of entrepreneurship education within medical sciences, several interrelated strategic levers should be considered:

1) Curriculum integration: Entrepreneurship competencies should be vertically and horizontally integrated across undergraduate and postgraduate training, aligned with local health system needs. 2) Faculty development: Faculty members require structured capacity-building programs to transition from traditional lecturing to facilitating innovation-oriented learning. 3) Enabling infrastructure: Universities should establish innovation labs, incubators, and seed funding mechanisms that allow students to translate ideas into prototypes and scalable solutions. 4) Intersectoral alignment: Sustainable implementation depends on structured collaboration between universities, industry, science and technology parks, and health innovation ecosystems. Without policy-level commitment across these domains, isolated educational pilots are unlikely to generate durable transformation.

## Conclusion

### Entrepreneurship as a core educational imperative

Entrepreneurship education in the medical sciences should not be regarded as a supplementary enrichment activity. It represents a strategic instrument for cultivating adaptive, opportunity-aware, and innovation-driven health professionals capable of navigating uncertain labor markets and complex health system challenges.

The experience from Iran suggests that even within traditionally structured educational systems, entrepreneurship can be systematically embedded when supported by coherent curricular design and institutional commitment.

The critical question is no longer whether medical students should learn entrepreneurship, but whether health systems can afford graduates who lack it.

## Key policy message

Embedding entrepreneurship education as a core component of medical science curricula is an evidence-informed strategy for strengthening workforce sustainability, innovation capacity, and long-term health system resilience.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of [Gonabad University of Medical Sciences](#), Gonabad, Iran. (Code: IR.GMU.REC.1404.054).

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### Authors' contributions

All authors equally contributed to preparing this article.

### Conflict of interest

The authors declared no conflicts of interest.

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