University Teaching Technology for Developing Medical Empathy

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Abstract. This paper shares a teaching toolkit built to help first-year medical students practice and keep their empathy, so that bedside manners grow alongside clinical know-how. Builds on Hojat's cognitive-affective model and Rogers' client-centered care, then refines Stepien & Baernstein's competency training by adding Bandura's social-learning theory and Decety & Jackson's mirror-neuron insights. We followed a three-step, design-based path: (1) defined what "medical empathy" looks like and how to spot it; (2) wrote a dedicated module and companion coursebook; (3) ran hands-on training that mixed simulations, role-plays, case debates, relaxation pauses and guided journals, weaving together values, knowledge, feelings and leadership. Self-ratings and reflective journals showed clear jumps in empathy, fewer stereotypes and greater ease in tough patient conversations. Lecturers said the sessions also re-energized their own teaching. The module now sits in the first-year curriculum and is being adapted for Nursing and Dentistry. With ready-made materials and staff workshops, other faculties can adopt it without starting from scratch. By turning many theories into a practical, tested package, we show that empathy can be taught, measured and kept alive even in hi-tech classrooms.

Keywords: medical education; empathy; instructional technology; empathic leadership; physician–patient relationship

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1. Introduction

Empathy is a core element of medical professionalism (Oala, 2022, p. 152). A substantial body of evidence shows that empathic physicians communicate more effectively, build mutual trust, elicit fuller histories, and achieve better adherence (Menezes, Guraya S. Y., & Guraya, S., 2021). Empathy is also associated with higher patient satisfaction, improved quality of care, and lower rates of errors and complications. (Chen, Xuan, Cai, Liu, & Shi, 2024). Importantly, sustained empathic practice benefits clinicians themselves, correlating with reduced stress and lower burnout (Shanafelt, & Noseworthy, 2017, pp. 129-146). Thus, strengthening empathy protects patients and supports the resilience and professional fulfilment of future physicians (Zhang, Pang, & Duan, 2023).

Empathy, however, does not develop automatically during medical training. Longitudinal studies document declines as students transition from preclinical to clinical phases (Chhabra, Chhabra, & Archer, 2022, pp. 79–89)—patterns linked to stress, cognitive overload, and desensitization; a nationwide, multi-institutional study by Hojat et al. (2020) confirms this trend (Hojat, Shannon, DeSantis, Speicher, Bragan, & Calabrese, 2020, pp. 911–918). These findings support the formal, curricular integration of structured empathy training so that empathic attitudes can be developed and maintained over time (Menezes, Guraya S. Y., & Guraya, S., 2021). Recent reform efforts emphasize the same imperative: scientific expertise must be taught alongside compassionate care (Zhang, Pang, & Duan, 2023). A theoretically grounded educational technology that fosters empathy systematically is therefore warranted.

This article presents a scientifically developed and validated university teaching technology designed to facilitate the development of medical empathy among undergraduate medical students (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 15)

2. The General Objectives of The University Instructional Technology Include: (1) developing the knowledge and skills required for empathic patient encounters; developing a comprehensive set of knowledge and skills essential for empathic interactions with patients; (2) enhancing medical students' capacity to deliver personalized care and respond effectively to the emotional distress of patients; and (3) fostering an empathy-oriented professional attitude that integrates technical competence with compassionate patient care (Cazac, 2023, p. 7).

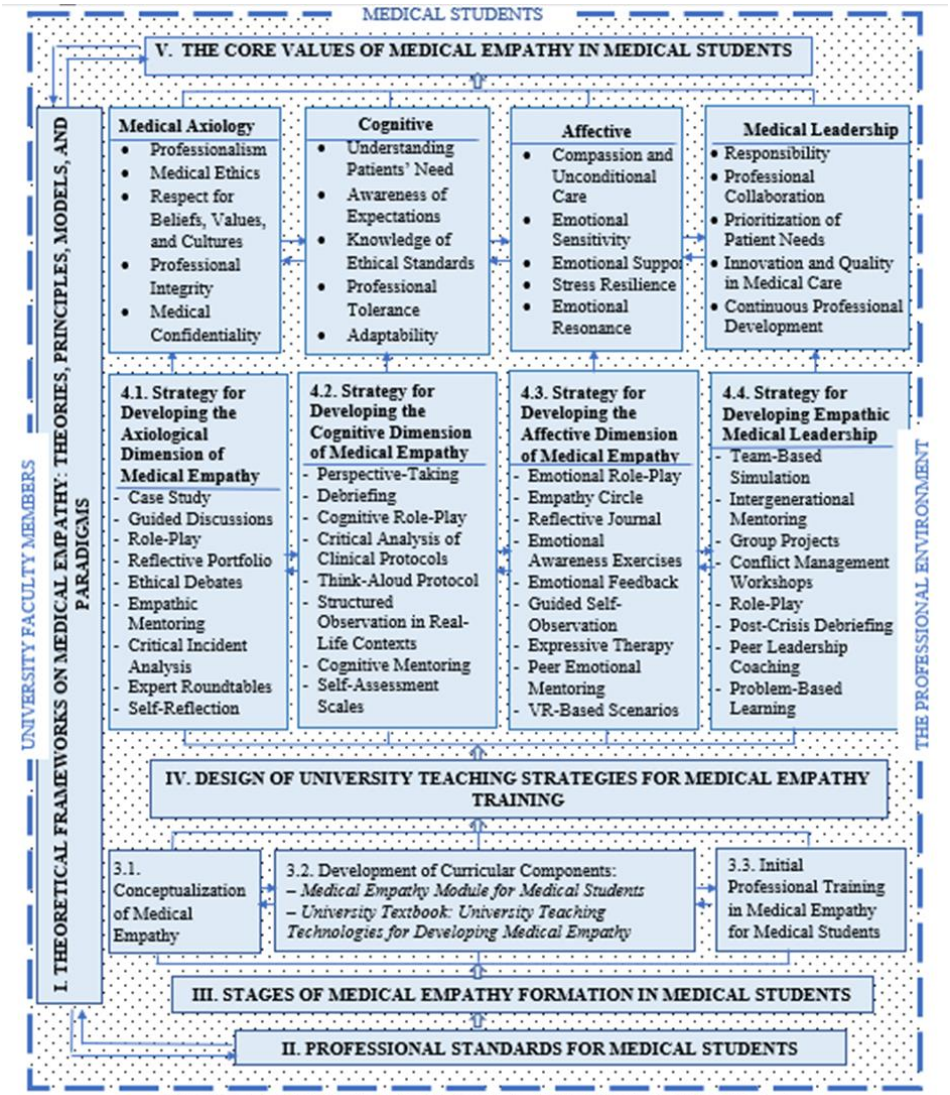

Fig.1. University Teaching Technology for Developing Medical Empathy in Medical Students

The design of the university teaching technology for developing medical empathy, rests on well-established frameworks in empathy research. *Bandura's social learning theory (1986)* highlights behavioral modelling, guided practice, and feedback as core mechanisms for acquiring interpersonal skills. In this view, students build empathy by observing effective examples and engaging in simulations and structured reflection—processes that support the internalization of empathic attitudes.

Rogers' humanistic theory (1951; 1980) further shapes the approach. It foregrounds authentic relationships and unconditional positive regard in clinician–patient encounters and argues for a learning climate attentive to students' emotional needs. This perspective legitimizes the integration of scientific knowledge with personal growth and humanistic development in medical education.

Neuroscientific accounts—from *Lipps (1900) to Decety and Jackson (2004)*—show that empathic responding recruits specific neural systems (e.g., mirroring processes). Such evidence suggests that empathy is plastic and can be strengthened through repeated, targeted practice.

Furthermore, the formulation of this educational technology aligns with **the professional standards** required of medical students in the Republic of Moldova, standards that mandate the inclusion of empathic competencies as a fundamental component of comprehensive physician training (Goleman, 2020). Developed in accordance with national and international educational policies, these standards emphasize the necessity for graduates to exhibit not only technical proficiency but also skills in empathic communication, ethics, and personal interaction, thereby ensuring high-quality medical care and effective therapeutic relationships (Goleman, 2020).

3. Stages of Medical Empathy Formation in Medical Students. The development of medical empathy is organized in three sequential stages that move learners from conceptual understanding to confident clinical use.

3.1. Conceptualization of Medical Empathy. This stage establishes the theoretical foundations of empathy in medicine (Oala, 2023, p. 266). Students are introduced to its cognitive elements (e.g., perspective-taking, understanding the patient's experience) and affective elements (emotional resonance, compassion). The framework integrates widely recognized reference points—*Bandura's* social learning (1986), *Rogers's* humanistic paradigm (1951, 1980), and neuroscientific models from *Lipps* (1900) to *Decety & Jackson* (2004). The content is aligned with the educational and ethical standards governing medical training in the Republic of Moldova. The outcome is a shared conceptual language and a robust mental model on which later practice can build.

3.2. Development of Curricular Components. The second stage translates theory into structured learning resources within the module *Medical Empathy for Medical Students*. It includes the university textbook *University Teaching Technologies for Developing Medical Empathy*, combined with annexes, activities, evaluation sheets, reflective portfolios, and case studies. These materials are designed for constructive alignment (objectives–methods–assessment), enabling students to connect concepts to practice through guided discussions, clinical simulations, and targeted exercises. The goal is a smooth and standards-compliant transition from theory to practice (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 221).

3.3. Initial Professional Training in Medical Empathy for Medical Students. The final stage focuses on application in clinical teaching. In courses and seminars, students engage in simulations, role-plays, case work, and structured reflection to practice and integrate empathic skills. Continuous feedback from educators, together with self-assessment via reflective portfolios, supports formative evaluation and iterative adjustment of strategies. At this point, empathy becomes an applied competence—visible in high-quality physician–patient interactions—and a core element of emerging professional identity for future physicians.

4. Designing University Teaching Strategies Focused on Developing Medical Empathy.

The practical core of this university teaching technology is a set of deliberately designed teaching strategies that target the four components of empathy—axiological, cognitive, affective, and leadership. Each strategy links clear objectives with appropriate methods, reflection, and assessment to

move students from knowing about empathy to demonstrably practicing it (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 221).

4.1. Strategy for Developing the Axiological Component. This strategy uses case studies and guided discussions to cultivate integrity, compassion, respect for human dignity, and medical ethics. Students interrogate real clinical dilemmas—confidentiality, informed consent, and equity in care—and articulate defensible positions. Reflective portfolios and self-assessment journals prompt systematic introspection, helping learners trace how their judgments form and how values translate into conduct. The aim is internalization: ethical principles become stable, enacted habits of practice.

4.2. Strategy for Developing the Cognitive Component. Through role-play, clinical scenarios, and structured debriefs, students strengthen understanding of patient needs and expectations and consolidate knowledge of ethical norms. Activities require weighing protocol requirements against individual patient contexts, building tolerance and adaptability. The outcome is cognitive empathy—transparent, well-reasoned decisions that integrate evidence with the patient's perspective.

4.3. Strategy for Developing the Affective Component. Emotional simulations, active-listening drills, and self-awareness techniques develop compassion, sensitivity, emotional support, and stress resilience. Learners practice in high-tension or crisis-like scenarios, receive targeted feedback, and reflect on their responses. The emphasis is on emotion regulation and accurate recognition of patients' affective states, enabling timely, appropriate empathic support in clinical encounters.

4.4. Strategy for Developing Empathic Medical Leadership. Leadership is trained through emergency scenarios, case-management exercises, and collaborative team projects. Students practice coordination, clear empathic communication, and rapid yet patient-centered decision-making. By adopting an empathic leadership stance, they develop assertive communication, support peers, and contribute to a climate of trust, cohesion, and continuous improvement in clinical teams.

Taken together, these strategies form a coherent, standards-aligned package that connects theory, pedagogy, and assessment. They make empathy teachable, practicable, and observable, reinforcing the foundational values of medical empathy across the curriculum.

5. The Values of Medical Empathy Among Medical Students

The core values of medical empathy are woven through every pedagogical move—from case analysis and guided discussion to simulation and practical exercises. Each strategy builds specific competencies and fortifies a value-based framework, so that empathy emerges not as a stand-alone topic but as a consistent pattern of professional behavior in future physicians.

Implementation Process in the University Setting. The educational technology was applied and tested in a university context by embedding the *Medical Empathy* module within the compulsory **Medical English** (Cazac, 2023) course for first-year students (Faculty of General Medicine). This setting was chosen strategically: English-language medical terminology and doctor–patient dialogues provided a natural arena for simulated clinical interactions and early practice of empathic communication—before the onset of clinical rotations.

Guided by a university teaching technology that insists on tight integration of theory and practice, each session was planned as an *"empathy micro-laboratory"*. Lesson plans specified content, operational objectives, methods, and assessment, all aligned with the university teaching technology's architecture (theoretical frameworks, standards, developmental stages, strategies, values, and empathic elements). Below, we illustrate the process-oriented nature of the approach with one representative lesson.

Lesson: Cerebral Stroke (Cazac, 2023, p. 112)**, and HIV/AIDS** (Cazac, 2023, p. 160)

Aim. To sensitize students to confidentiality as an ethical value with direct empathic implications for patient care.

Materials and assessment. The lesson was delivered as an in-depth case study from the university textbook *University Teaching Technologies for Developing Medical Empathy* and evaluated using the Empathy Self-Evaluation Checklist (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 266). The design served a dual purpose:

(a) to assess competencies in action and (b) to deepen understanding of the values that shape physician–patient relationships.

Conceptual framing. Students reviewed the meaning and importance of medical confidentiality, with emphasis on sensitive conditions (Cazac, 2023, p. 164) Core axiological principles—privacy, dignity, trust—were explicitly linked to empathy: an empathic physician anticipates the moral and emotional harm caused by unauthorized disclosure.

Learning activities.

- **Case analysis (small groups):** comparison of two scenarios—one involving a public breach of an HIV diagnosis; another in which a stroke patient's data were scrupulously protected. Groups mapped patient emotions, clinician decision points, and ethical consequences.

- **Role-play:** a physician tempted to disclose a stroke patient's status to extended family without consent; a peer enacted the "empathic conscience," arguing for confidentiality on ethical and empathic grounds.

Debrief and reflection. Class discussion surfaced diverse perspectives and the emotional intensity of confidentiality breaches. Many students reported that they had underestimated the psychological impact on patients (shame, loss of trust). Educators underscored that empathy includes anticipating moral distress, not only recognizing physical suffering. Students documented insights in reflective notes, connecting principles to concrete communicative choices with families.

Observed outcomes. Following the session, instructors noted a marked increase in ethical awareness. Students articulated a clearer commitment to discretion and to transparent, compassionate communication with families, frequently paraphrased as: *"Empathy also means safeguarding the patient's dignity, not just alleviating their pain."*

Embedding the module in Medical English enabled early, low-risk rehearsal of empathic behaviors while maintaining curricular efficiency. The micro-laboratory format ensured constructive alignment (objectives ↔ methods ↔ assessment) and made values visible, discussable, and assessable within realistic clinical narratives.

Lesson: "What Is Blood"? (Cazac, 2023, p. 30)

Rationale and aims. Delivered in English, this integrative, intercultural lesson foregrounded the axiological dimension of empathy while linking it to the cognitive

domain. It pursued two aims: (1) to consolidate biomedical knowledge about blood (functions, composition, clinical relevance) and (2) to cultivate respect for cultural and religious values surrounding blood and transfusion, thereby strengthening empathic, patient-centered care.

Design and activities. The session opened with a brief brainstorm on the word *blood*, eliciting both biomedical terms ("oxygen transport," "blood cells") and value-laden associations ("life," "family," "sacrifice"). A short interactive review refreshed scientific content. The focus then shifted to ethical dilemmas frequently encountered in practice: refusal of transfusion by Mrs. Cook (Cazac, 2023, p. 34), voluntary donation, and stigma linked to "infected blood" in HIV. Students conducted role-plays of pre-transfusion counselling, alternating roles (physician, hesitant family). To surface the value landscape explicitly, they completed the Rokeach Value Survey and Schwartz Value Survey, mapping how belief systems shape decisions about blood (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 226).

Learning tensions made visible. In debrief, students acting as physicians reported the pull between the impulse to save life and the duty to respect the patient's beliefs. Discussion centered on cultural respect as a core element of empathy—understanding *why* a patient holds a conviction and addressing the person with dignity, even when the clinician does not share that view.

Outcomes. Students recognized that an apparently technical topic can carry profound ethical and emotional meanings. Many noted a shift from seeing blood as a purely laboratory object to seeing "the patient behind the sample." This reframing reflects the lesson's intent: to connect sound scientific understanding with humanistic care.

Implication for the module. By intentionally integrating values work with biomedical content and communicative practice, the lesson operationalizes the module's goals—aligning conceptual knowledge, cultural sensitivity, and empathic communication in a way that is teachable, discussable, and transferable to clinical encounters.

Lesson: "Understanding and Approaching Patients with HIV/AIDS"

Aim and focus. This lesson targeted the cognitive component of empathy, with explicit ethical integration. The objective was to deepen students' understanding of the needs of people living with HIV/AIDS and to cultivate informed, tolerant, and empathic attitudes.

Structure and tools. After a concise overview of HIV/AIDS (definitions, incidence, individual and societal impact) to establish a shared factual base, the focus shifted to the patient's perspective using the Perspective-Taking Scale (PT) (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 232). Case analysis centered on Marius, a young HIV-positive patient facing stigma. Guided by faculty and the Interpersonal Reactivity Index (IRI) (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 230), students identified core needs: confidentiality, emotional support, unbiased treatment, and clear information.

Applied tasks. Learners designed concrete care strategies—e.g., allocating extra counselling time, using plain, non-stigmatizing language, and integrating a psychologist into the team—demonstrating the merger of clinical reasoning with cognitive empathy.

Ethical deliberation. In the second part, students examined dilemmas around disclosure without consent using the Schwartz Value Survey (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 221). Discussions required adopting multiple perspectives: the patient fearing judgment, the partner's right to know, and the physician navigating competing obligations. This exercise sharpened ethical analysis and illuminated the social–emotional context of stigmatizing conditions.

Structured discussion and reflective practice. Group debates (pro/contra disclosure) were followed by brief reflective writings (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 228) in which students documented their emotional responses when role-playing physician or patient and articulated reasoned courses of action in similar real-world scenarios.

Learning outcomes. Reflections pointed to cognitive maturation: students acknowledged clinical complexity and the need for deliberation before action, consistently centering the patient's perspective. Instructors observed a marked reduction in fatalistic or stereotyped views—initial prejudices gave way to seeing HIV-positive individuals as patients with a chronic condition who merit equitable, respectful care.

Implication. The lesson demonstrates how structured perspective-taking, validated measurement tools, and ethical debate can convert abstract principles into practical, empathic conduct, effectively countering stigma through informed empathy.

Lesson: "Exploring and Enhancing Affective Competencies in Mental Health Contexts"

Aim and placement. Scheduled near the end of the module—once core concepts were established—this 90-minute, student-centered session targeted the affective dimension of empathy: providing emotional support and sustaining resilience when working with patients who have mental-health disorders.

Set-up. A brief discussion on attitudes toward psychiatric patients framed empathy as pivotal in contexts where stigma and fear can undermine the therapeutic alliance.

Learning activities (approx. 30 minutes of skills practice):

- **Role-play consultations** with anxious or depressed patients (students alternating physician/patient roles). The physician role emphasized active listening, patience, verbal validation, and concise guidance (e.g., *"I can see this feels overwhelming—let's work through it together."*) (Cazac, 2023, p. 104).
- **Case analysis** of a highly stressed medical student to practice peer empathy (support from colleagues and faculty), not only patient-directed empathy.
- **Brief relaxation training** (focused breathing, progressive muscle relaxation) to build self-regulation skills. Students recognized personal stress as a barrier to empathic attunement and valued the techniques for both self-care and patient care.

Reflection and consolidation. Using the Reflective Writing Exercises (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 228), students documented insights from role-plays and noted changes in how they would approach psychological distress. Responses were consistently positive: many reported greater attention to nonverbal cues, increased patience, and reduced judgmental language (e.g., *"I never realized how hard it is to be in the shoes of an anxious patient until I played the role myself."*). Faculty observations confirmed high emotional engagement, indicating that students did not only discuss empathy but experienced it in practice.

Outcomes and implications. The session strengthened emotional intelligence, affect regulation, and empathic presence—competencies that complement pharmacologic and procedural care. Such training is directly transferable to psychiatry, family medicine, and palliative care and supports the longer-term goal of forming clinicians who can manage their own stress while responding sensitively and effectively to patients' emotional needs.

Lesson: "Professionalism and Empathy in Stroke Management"

Aim and scenario. This integrative session targeted empathic leadership and the coordinated use of all empathy components in an acute setting. Students managed a

simulated emergency stroke in the ED, acting as the clinical team and responding rapidly and safely.

Objectives. (1) Build practical competence in acute stroke care (symptom recognition, protocol selection). (2) Demonstrate clear, empathic communication with both the patient and family members.

Design and activities. Students rotated as case leader, coordinating tasks (oxygen, IV access, CT request) while engaging the patient's anxious relatives. The exercise required dual attention: swift clinical decisions and calm, compassionate updates (e.g., *"We're taking him for a CT scan now. I understand this is frightening—we're doing everything we can."*). Leadership behavior was expected to be assertive yet respectful.

Debrief and learning points. In post-simulation discussion, several students acknowledged prioritizing procedures and under-communicating with the family—recognizing that *"a comforting word can be as important as an injection."* Others reflected on the challenge of task delegation (over-authoritative vs. hesitant styles). Faculty emphasized that empathic leadership sustains team cohesion through clarity and encouragement, not pressure, and that post-case support for the team matters.

Observed outcomes. By the end, students who had initially separated "technical work" from "people work" began to integrate them. One student, for example, explained stroke in plain language to the patient's daughter, offered gentle reassurance, and simultaneously directed the team effectively—illustrating the synthesis of clinical competence and empathic professionalism.

Evaluation and Reflections. Throughout the implementation of the university teaching technology, formative and summative evaluation played a key role. Students received ongoing feedback and were encouraged to assess their own progress—for instance, by completing the "Emotional Empathy Scale" (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 240) at the beginning and end of the module. The final assessment took the form of a reflective portfolio (Oala, Cojocaru-Borozan, & Golubovschi, 2025, p. 228), in which each student compiled their completed materials—journals, case analyses, self-assessments—accompanied by a final essay on what empathy had come to mean for them by the end of the module compared to the beginning.

All participants reported a positive attitudinal shift, reframing empathy as integral to competent practice rather than a peripheral "soft skill." Many cited concrete transfers

to clinical placements: more active listening with difficult patients, greater patience with confused older adults, and steadier emotion regulation after patient loss.

Instructors who were initially skeptical about classroom/online teaching of empathy became promoters after observing students' growth. As one noted, *"After years of teaching only anatomy and physiology, teaching empathy rehumanized my own educational practice—I got to know my students as people, not just as grades."* Beyond individual gains, the technology reshaped the academic culture, catalyzing ongoing dialogue about values and humanism in medical education.

6. Integration of Resources and Sustainability of the Intervention.

A pivotal anchor for implementation was the university textbook *University Didactic Technologies for Developing Medical Empathy*. It provided a lesson-by-lesson blueprint—objectives, content, methods, and assessment—ensuring constructive alignment and instructional coherence (Oala, Cojocaru-Borozan, & Golubovschi, 2025).

Long-term sustainability rests on embedding the **Medical Empathy** module within the core curriculum and delivering it annually to successive cohorts. Parallel work targets adaptation for other specialties (e.g., Nursing, Dentistry), with content tailored to each faculty's clinical realities (Oala, 2022, p. 152).

Sustainability also depends on people. Targeted workshops for clinical educators focus on integrating empathy into everyday teaching (case facilitation, feedback, assessment), promoting coherence across preclinical and clinical stages rather than confining empathy to a single module.

Grounded in contemporary educational principles and supported by the specialized literature, the university teaching technology offers a flexible framework that can be adapted to diverse cultural and curricular contexts. Institutions can adopt the architecture (values–strategies–assessment) while customizing scenarios and instruments.

Documented outcomes indicate that students become more empathic, more attentive to the human dimension of care, and better prepared for patient-centered practice. The approach has proven feasible in routine teaching and has functioned as a catalyst for dialogue on humanism within the academic community.

As an innovative and necessary response to current training needs, this university teaching technology shows that medical empathy can be cultivated systematically.

Its multi-layered design—axiological, cognitive, affective, and leadership components—supports holistic formation, translating empathy from an abstract value into tangible, trainable, and assessable behaviors. The process-oriented design, reflected in the instructional activities described, demonstrates measurable influence on professional identity formation.

Such initiatives help medical education fulfil its dual mission: to transmit science and to shape character. In an increasingly technologized healthcare environment, restoring empathy as a core value brings balance and ensures care that is both effective and deeply human.

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