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EDITORIAL

Beyond the classroom: digital technology and simulation as drivers of health sciences education

Más allá de las aulas: la tecnología digital y la simulación como impulsores de la educación en ciencias de la salud

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Framed within a constantly evolving educational environment, the integration of digital technologies and the use of simulations are not only inevitable trends, but also critical responses to the modern needs of professional training in health sciences. As institutions seek ways to improve clinical learning, accumulating cognitive evidence is beginning to close the debate: technology not only complements but, in many respects, surpasses traditional teaching methods. In this regard, a review of 333 studies with more than 12,000 participants confirms what many educators had already inferred: mobile platforms and virtual simulations consistently improve the acquisition of clinical knowledge and practical skills, with positive effects ranging from modest to significant [(1)].

In a world where time is scarce and personal commitments are many, providing access to content anytime and anywhere has ceased to be a luxury and has become a pedagogical necessity. Additionally, given the proven effectiveness of digital technologies in the development of clinical competencies, accessibility to these platforms has become a priority, as they allow for flexible, autonomous, and user-adapted learning. Scientific evidence reports standardized performance differences exceeding traditional teaching methods by up to 1.12 points [(2)]. Moreover, these technologies align with the learning styles of a digitally native generation, where intuitive interaction, real-time informative feedback, concurrent visual access, and the dynamism of app interfaces make learning a highly effective and engaging experience.

On the other hand, simulation-based education has revolutionized the clinical training of future health professionals. By safely repeating procedures and analyzing in greater detail the complexity of the most probable scenarios without posing any risk to patients, the retention of imparted knowledge is enhanced, and student confidence is strengthened. Indeed, the data are compelling: simulations with advanced technologies—such as virtual patients or mixed reality—achieve significant differences in academic performance, with effect sizes reaching up to 90% compared to traditional teaching [(3)]. Consequently, the benefits are not only quantitative, but the improvement in the quality of professional performance suggests a profound transformation in the competencies emerging from universities. This is reflected in a higher demand for clinical specializations in institutions offering this type of teaching, as well as greater levels of satisfaction, motivation, and perceived self-efficacy [(4)].

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However, despite the described and documented advantages, the success of these technologies depends on a careful level of integration into educational curricula. It is not enough to simply "digitize" existing content; it is essential to redesign objectives, teaching methodologies, and assessments to align them with the potential of these technological tools. In this sense, teacher training becomes crucial and unavoidable, as one must ask: How can teaching with technological tools succeed if educators are unfamiliar with their effective use? This raises further questions: What digital competencies should a health sciences educator possess? How can traditional assessment models be improved to match the new formative processes?

Undoubtedly, the evidence is on the table. Modern health sciences education can no longer afford to remain indifferent to the availability of technological tools which, when applied with technical criteria, enhance learning and practical clinical preparation. In this regard, institutional leaders, healthcare managers, and educators must act with foresight, incorporating technology not as an optional tool, but as an essential element in the academic training process of competent professionals in a complex world that demands better skills and greater problem-solving capacity.

Ultimately, it is time to redesign education—not only adapting it to technology, but integrating it with a clear purpose and scientific rigor.

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