Surgical telehealth in medical education: a qualitative contribution that invites a mixed approach

Telesalud quirúrgica en educación médica: un aporte cualitativo que invita al abordaje mixto

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Dear Editor:

We have read with special interest the article entitled *"Telehealth and teaching of surgery: creation of an open-access surgical multimedia repository"* , recently published in your journal (RevEspEduMed 2025, 3: 656021). As teachers and researchers in health sciences education, we congratulate the author for an innovative, situated and pertinent proposal that responds to one of the most critical challenges left by the pandemic: guaranteeing surgical training in technology-mediated scenarios, even in contexts with restrictions on real clinical access, a situation that we constantly experience in various Latin American universities (1).

We celebrate the study's qualitative approach, based on grounded theory, which allows for a deeper understanding of the perceptions and meanings constructed by students and teachers regarding the use of telehealth as a teaching strategy. This approach is essential for addressing complex educational problems involving pedagogical, technological, emotional, and contextual factors, especially in times of crisis. As has been noted in previous research published in this journal, qualitative methods are especially useful for capturing the richness of educational phenomena in dynamic and challenging environments, facilitating the design of contextualized and meaningful interventions (2).

Another of the study's major achievements is the incorporation of the Multimedia Cognitive Learning Theory (MCLT) as the basis for the instructional design of digital learning objects (DLOs). The explicit application of principles such as segmentation, coherence, signaling, and dual-channel instruction not only enhances the pedagogical quality of the VTQ UNAH 101 repository but also exemplifies good practices for the development of digital educational resources in surgery. This type of integration between educational theory and teaching practice remains scarce in clinical contexts, where the intuitive or replicative use of resources predominates. Recent research in medical education has shown that video-based approaches, when designed with clear pedagogical criteria, significantly improve the acquisition of clinical knowledge and skills in health sciences students (3-4).

Furthermore, we believe that this valuable contribution can be expanded through an exploratory sequential mixed-methods design , which allows for the richness of interpretation of qualitative analysis to be complemented with quantitative measurements that capture the scope and magnitude of the observed effects. This approach would strengthen the external validity of the study, identify replicable patterns, and contribute to educational decision-making with greater empirical solidity. Surgical telehealth, as an expanding pedagogical innovation, requires analysis

from multiple levels and dimensions, as proposed by research integrating mixed methodologies to address the complexity of clinical teaching environments in healthcare. Furthermore, authors such as Schoonenboom and Johnson emphasize that sequential designs allow for more robust inferences by linking the exploration of meanings with the verification of patterns, which is particularly useful in emerging fields such as the integration of technology in medical education (5-6).

Telehealth represents not only a temporary solution to health crises such as the COVID-19 pandemic, but also a structural strategy with a high transformative potential for health education systems in Latin America. In a region characterized by unequal resource distribution, gaps in access to specialized services, and a marked concentration of hospital infrastructure in urban areas, telehealth tools—particularly their educational component—allow for the democratization of access to clinical learning. Initiatives such as the one described in the article acquire special relevance by demonstrating that it is possible to generate high-quality, contextualized, and culturally relevant resources that transcend the physical limitations of the traditional operating room. Various international organizations have recognized that strengthening telehealth capacities can accelerate educational equity in countries with fragmented health systems, provided it is accompanied by adequate regulatory frameworks, teacher training, and connectivity guarantees (7).

We thank the editorial team for the opportunity to share this reflection, but above all, for highlighting research that responds to new teaching and learning scenarios in health sciences, and the author for contributing a highly relevant and regionally applicable training experience.

Declaration of conflict of interest : The authors declare that they have no conflict of interest.

References

1. Munguia Lozano L. Telehealth and surgical teaching: creation of an open-access surgical multimedia repository. *Rev Esp Edu Med* **2025** , 6(3). https://revistas.um.es/edumed/article/view/656021

2. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* . **2014** , 89(9), 1245-51. https://doi.org/10.1097/ACM.0000000000000388

3. Mayer RE. The Cambridge Handbook of Multimedia Learning. 3rd ed. Cambridge: Cambridge University Press; 2022.

4. Morgado M, Botelho J, Machado V, Mendes JJ, Adesope O, Proença L. Video-based approaches in health education: a systematic review and meta-analysis. *Sci Rep.* **202** 4, 14, 23651. https://doi.org/ 10.1038/s41598-024-73671-7

5. Hamui-Sutton Alicia. A mixed methods approach to research in medical education. *Medical Education Research* **2013** , 2(8), 211-216. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2007-50572013000400006&lng=es .

6. Schoonenboom J, Johnson RB. The logic and design of mixed methods research. In: Poth CN, Hitchcock JH, editors. *The SAGE Handbook of Mixed Methods Research Design* . London: SAGE Publications; **2023** . p. 91–111.

7. Pan American Health Organization. Telehealth in Latin America and the Caribbean: Situation Analysis, Recommendations, and Baseline for the Development of a Regional Agenda. Washington , DC: PAHO; **2020.** https://iris.paho.org/handle/10665.2/52336