

## Smart Ideas, Skilled Hands: The Role of Passion in Surgical Learning

Ideas Inteligentes, Manos Expertas: El Papel de la Pasión en el Aprendizaje Quirúrgico

Guglielmo Mantica<sup>1</sup>; Giorgia Trani<sup>1</sup>; Rafaela Malinaric<sup>2</sup> & Carlo Terrone<sup>1</sup>

Dear Editor,

We read with great interest the article by Park & Shin (2025) titled "Innovative and Cost-Effective Kidney Anatomy Education Using Tomato Models" and we commend the authors. The authors have successfully highlighted how simple, low-cost resources can revolutionize medical education, making it more inclusive, accessible, and effective across different learning environments.

The idea of utilizing tomatoes and vegetables to replicate kidney anatomy demonstrates that educational excellence does not always require sophisticated or expensive materials. Rather, creativity, resourcefulness, and a deep understanding of educational needs can produce powerful tools for student engagement and knowledge acquisition and learning. In a time when disparities in educational resources are still evident worldwide, the ability to create realistic anatomical models with easily available materials represents a significant step.

We would also like to share our own experience with a similar approach, which further supports the findings of the authors. In our institution, we have developed and implemented a "tomato model" for surgical training of residents (Mantica *et al.*, 2021). Beyond the practicality and anatomical similarities provided by the tomato's natural structure, we observed a remarkable level of enthusiasm among students and trainees when constructing and utilizing this simple model.

Enthusiasm, we believe, is one of the key drivers of success not only in training but also throughout a medical career. The passion and excitement that we have seen during the use of the tomato model was greater than what we have typically observed when using more sophisticated training models available in our clinical practice for difficult

surgeries such as percutaneous nephrolithotomy (PCNL) (Mantica *et al.*, 2022a). Residents expressed a sense of creativity, actively participating in both the preparation and the learning processes, which translated into improved engagement, concentration, and dedication. This emotional involvement, often underestimated in traditional training settings, plays a critical role in consolidating technical skills and professional identity (Kavic, 1999; Gardner & Willis, 2022). Thus, models like these, have a powerful advantage: they transform learning from a passive reception of knowledge into an active and passionate journey.

Moreover, the practical ease of preparing such models enhances flexibility in educational planning, allowing for spontaneous sessions and a more personalized practice of surgery. A key advantage of these models, compared to more realistic alternatives such as cadaver-based simulations, is that they do not require complex legislation, ethical approvals, or standardization procedures (Mantica *et al.*, 2022b). This makes them universally accessible and easily implementable in any setting, from high-tech institutions to resource-limited environments (Achanga *et al.*, 2025; Mantica *et al.*, 2019; Nadeem, 2024). This aspect is crucial for democratizing education, ensuring that every student, regardless of geographic or economic barriers, can access high-quality, hands-on anatomical training.

**KEY WORDS:** Training; Surgical training; Tomato; Passion; Ideas.

### REFERENCES

Achanga, B. A.; Bisimwa, C. W.; Femi-Lawal, V. O.; Akwo, N. S. & Toh, T. F. Surgical Practice in Resource-Limited Settings: Perspectives of Medical Students and Early Career Doctors: A Narrative Review. *Health Sci Rep.* 14;8(1):e70352, 2025. doi: 10.1002/hsr2.70352. PMID: 39810920; PMCID: PMC11729344.

<sup>1</sup> Department of Surgical and Diagnostic Integrated Sciences (DISC), University of Genoa, Genoa, Italy.

<sup>2</sup> IRCCS Ospedale Policlinico San Martino, Genoa, Italy.

- Gardner, A. K. & Willis, R. E. Measuring the fire in their hearts: assessing passion for the profession among students pursuing surgical careers. *Global Surg. Educ.* 1(1):6, 2022. doi: 10.1007/s44186-022-00005-4. Epub 2022 Feb 28. PMID: 38624993; PMCID: PMC8884411.
- Kavic, M. S. Surgery, passion, and the medical student. *JSLs*. 3(3):169-70, 1999. PMID: 10527325; PMCID: PMC3113149.
- Mantica, G.; Balzarini, F.; Chierigo, F.; Keller, E. X.; Talso, M.; Emiliani, E.; Pietropaolo, A.; Papalia, R.; Scarpa, R. M.; Terrone, C.; Esperto, F. & European Society of Residents in Urology (ESRU) and Young Academic Urologists (YAU). The fight between PCNL, laparoscopic and robotic pyelolithotomy: do we have a winner? A systematic review and meta-analysis. *Minerva Urol Nephrol.*, 74(2):169-77, 2022. doi: 10.23736/S2724-6051.21.04587-0. Epub 2022 Feb 11. PMID: 35147384.
- Mantica, G.; Fransvea, P.; Virdis F.; Hardcastle, T. C.; Ackermann, H.; Terrone, C.; Costa, G.; Van der Merwe, A.; Balducci, G. & Steyn, E. Surgical Training in South Africa: An Overview and Attempt to Assess the Training System from the Perspective of Foreign Trainees. *World J. Surg.*, 43(9):2137-42, 2019. doi: 10.1007/s00268-019-05034-7. PMID: 31111230.
- Mantica, G.; Leonardi, R.; Diaz, R. *et al*; CACTUS group. Reporting Characteristics of cadaver training and Surgical studies: The CACTUS guidelines. *Int. J. Surg.*, 101:106619, 2022. doi: 10.1016/j.ijsu.2022.106619. Epub 2022 Apr 14. PMID: 35429658.
- Mantica, G.; Malinaric, R.; Ndrevataj, D.; Pacchetti, A.; Tognoni, P.; Suardi, N.; Van der Merwe, A.; Bottino, P. & Terrone, C. The Tomato Model. *Urology*, 157:280-1, 2021. doi: 10.1016/j.urology.2021.07.025. Epub 2021 Aug 10. PMID: 34389429.
- Nadeem, A. Surgical Training Pathways in the United Kingdom and the United States: Lessons for Resource-Limited Settings From High-Income Countries. *Cureus*, 8;16(11):e73285, 2024. doi: 10.7759/cureus.73285. PMID: 39524163; PMCID: PMC11546745.
- Park, S. K. & Shin, D. Development of a Low-Cost Kidney Model Using Tomatoes and Its Applicability in Anatomy Education | Desarrollo de un Modelo de Riñón de Bajo Costo Utilizando Tomates y su Aplicabilidad en la Enseñanza de la Anatomía. *Int. J. Morphol.*, 43(1): 1-4, 2025.

Corresponding author:

Dr. Guglielmo Mantica

Department of Surgical and Diagnostic Integrated Sciences (DISC)

University of Genoa

IRCCS Ospedale Policlinico San Martino

Largo Rosanna Benzi 10

16132, Geno

ITALY

Email: guglielmo.mantica@gmail.com