Trends and topics on the science of ophthalmic education

This new focused issue of *Annals of Eye Science* is dedicated to the science through which the knowledge, skills and values of medicine are conveyed through generations: the science of Medical Education. We selected a variety of topics of interest for teachers and trainees in different stages of training; topics related to knowledge, clinical and surgical teaching, and the acquisition of professional values.

When considering transfer of knowledge, conferences continue undoubtedly to be among the most widely used and disseminated methods at all levels of professional education, but also among the most controversial in terms of their effectiveness. In '*Improving presentation effectiveness*', Mayorga presents a series of recommendations to improve this method, in order to reduce the forgetting curve and facilitate the acquisition of high-order learning objectives (to analyze, to evaluate, to create). He classified these actions into four main groups: (I) to apply the principles of adult learning; (II) to apply multi-media principles, (III) to apply interactivity to conferences, and (IV) to provide performance support documents.

Social media are becoming increasingly popular in teaching and learning. In '*Teaching through social media*', Filipe and Mack explain the role of social media in learning in complex environments, leading to and fulfilling the social aspect of learning. They describe the evolution of educational theories from those centered on the teacher to the modern concept of heutagogy, which intends to achieve self-determined students, as well as the teaching role evolving from being the center of the educational process to becoming a facilitator and collaborator of student's learning. They describe the advantages of social media as facilitators of the interaction between individuals that form communities of learning, and the effectiveness, risks and barriers to their use in medical education.

When considering clinical education, Fernandez and Burguera-Gimenez explain in '*Teaching Evidence-based Ophthalmology*' the benefits it has for patients and health professionals, the steps to practice it, and propose a hierarchy of teaching and learning this skill.

No teaching strategy can be considered effective if competence acquisition and performance are not verified. The importance of assessment is highlighted by Golnik in '*Clinical Evaluation Exercises and Direct Observation of Surgical Skills in Ophthalmology*'. This article discusses the need for assessment at work with authentic, valid and reliable methods of observation and evaluation of competency acquisition, specific for Ophthalmology: in the clinic, the Ophthalmic Clinical Evaluation Exercise (OCEX); in the emergency, the On-Call Consultation Assessment Tool (OCAT); in surgery, the International Council of Ophthalmology Ophthalmic Surgery Competency Assessment Rubric, among others.

Ophthalmology training involves the challenge of surgical education that focuses on patient safety and resident well-being. In '*Ophthalmic Surgery Teaching*' Roberts, Plant and Hodge pose the challenge of teaching and learning ophthalmic surgery. They discuss a number of considerations relevant to the principles of adult learning and their relevance in surgical training, and propose a variety of strategies to make teaching more effective, without neglecting patient safety. They demonstrate the need of assessment rubrics, also useful as guides for learning, and emphasize the importance of cognitive development in addition to technical, as well as communication skills before and during surgery.

In '*Virtual Reality in Residents Training*' López-Cabrera and Valdez-García explore the use of virtual reality in surgical ophthalmology training and describe the characteristics of three simulators currently on the market. They also review a number of studies on the validation of these simulators.

Good ophthalmic education should not only consider knowledge and technical and surgical skills, but also train students and doctors in all aspects of professional competence, such as professionalism, communication skills, teamwork, and leadership. With this in mind, Green, Atik and Hay explore the role of leadership in health care and ophthalmology in '*Developing Leadership Skills in Young Ophthalmologists*'. They discuss the value of leadership at the clinical, educational and organizational level, and provide recommendations to ensure the continued development of future effective leaders.

Finally, in '*Faculty Development for Teaching and Assessing Residents' Professionalism*', Palis and Altszul raise the need to train faculty in how to teach professionalism, a quality that is taught primarily through teachers' example. While it is a requirement in competence training frameworks for various organizations and accreditation standards worldwide, little emphasis has been put on how this aspect of professional competence is taught, nor how teachers can improve their personal professionalism to role model it to trainees.

We hope this issue will be useful and valuable for advancing the science of medical education, for the best benefit of the ophthalmologists we train, our communities, and ultimately our patients, the reason of our work.

Acknowledgments

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *Annals of Eye Science* for the series "Modern Teaching Techniques in Ophthalmology". The article did not undergo external peer review.

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/aes.2019.09.03). The series "Modern Teaching Techniques in Ophthalmology" was commissioned by the editorial office without any funding or sponsorship. AGP and JFVG served as the unpaid Guest Editors of the series. The authors have no other conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ana Gabriela Palis

Jorge E. Valdez-García

Ana Gabriela Palis, MD[1]

[1]*Department of Ophthalmology, Hospital Italiano de Buenos Aires, Buenos Aires, Argentina;*
(*Email: gpalis@gmail.com*)

Jorge E. Valdez-García, MD[2]

[2]*Ophthalmology and Visual Science Institute, School of Medicine and Health Science, Tecnologico de Monterrey, Monterrey, Mexico.*
(*Email: Jorge.valdez@itesm.mx*)