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LETTER TO THE EDITORS

Enhancing Telemedicine Perioperative Simulations Using Augmented Reality

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TO THE EDITORS:

We would like to applaud Watt et al¹ for conducting an insightful investigation into the successful use of telemedicine simulation to enhance anesthesiology resident education. They highlighted the value of remote simulations and successfully demonstrated the feasibility of using telemedicine to teach optimal preoperative evaluation. Since the COVID-19 pandemic, online pedagogy has gained momentum as a supplement to in-person learning. As anesthesiologists adapt to medical education's changing landscape, immersive technologies such as augmented reality (AR) are being used to enhance remote simulation experiences. AR has emerged as an effective, cost-efficient, and versatile platform for remote medical education while simultaneously addressing the challenges of traditional, mannequin-based simulations. We highlight the characteristics and advantages of using AR-based simulations for anesthesiology training and education.

Typical remote learning lacks engagement and experiential satisfaction in health care trainees.² However, remote AR simulation provides engaging, flexible, nonalgorithmic scenarios. By providing a shared holographic space in which both the instructor and trainees can interact,

AR simulations allow real-time instructor-learner interactions in both in-person and remote settings.³ Furthermore, AR simulations provide multiplayer capabilities with teamwork and dynamic training using a variety of scenarios.³

In addition to its efficacy in providing high-fidelity simulations, AR platforms are cost-effective relative to traditional, mannequin-based simulations. Sophisticated mannequins are expensive and require ongoing maintenance, technicians, and dedicated simulation centers. AR simulations reduce the need for these resources by relying on portable, easily deployable head-mounted displays. Consequently, AR modalities are significantly faster to set up and initiate than in situ simulations, offering cost- and time-savings that optimize operational workflow in busy perioperative environments.

Aside from its cost-effectiveness, AR offers other operational versatility and conveniences compared with traditional simulations. By using AR, nearly any location with a wireless Internet connection can be used as a learning environment. Traditional simulations, including telemedicine simulations, require a dedicated learning space, which can have limited availability to accommodate groups. Because AR simulations only

require head-mounted displays and an Internet connection, they can be delivered in socially distanced settings, domestically and internationally, and have been deployed as a part of our institution's global health initiative. Multiple participants can be efficiently trained during the same scenario without the redundant turnovers required by traditional simulations.³

In this study, telemedicine simulation provided a single clinical training scenario that obviated the need for in-person training.¹ AR simulations further enhance remote learning by providing engaging, dynamic simulations while overcoming barriers of traditional simulations. We support the use of remote learning for perioperative simulations and believe that adoption of AR simulations represents a novel technology with strong potential to advance remote educational experiences.

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