Lessons from a pilot for extended reality anatomy for MD students

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The Goal
To provide more exposure time for anatomy practice beyond the limited hours in Anatomy lab, with a focus on immersive learning experiences.

The Design
Yale School of Medicine (YSM) acquired 20 HoloLens devices with AnatomyX software to supplement the traditional anatomy lab with cadavers. The pilot lasted from July 2023 – December 2024.

What Went Well
- **Cutting-Edge Technology:** For many faculty and students extended reality is an experience that delivers a "wow" factor, including prospective students. Additionally, the allure of seeing new technology being tried inspired faculty to engage with innovative methods, fostering a culture of continuous improvement and exploration.

Why Didn't It Take Off?
- **Clumsy interface:** The gestures and voice commands were complicated to learn, and the software didn't run smoothly.
- **Model inaccuracies:** Instructors shared that some key anatomical labels were incorrect in the vendor 3D models, reducing confidence in the content quality.
- **Limited physical access:** The devices were in a separate location from class and study areas, accessible only within business hours rather than student study hours.
- **Unclear incentives and training:** The 3D models were presented as an ad-hoc learning opportunity, with no integration in the lab lessons. A tutorial was done when devices were first introduced, but otherwise it was up to the students to navigate the models on their own or initiate support with IT.
- **Vendor support:** Microsoft officially discontinued HoloLens 2 production in October 2024 and announced its complete exit from HoloLens hardware development in February 2025.

What Comes Next?
- **More convenient access:** The headsets were relocated to lockers in a central space in the medical library with 24/7 badge access for home use.
- **Exploring alternative internal digital models:** The faculty is looking into extending the current internal capabilities at YSM (e.g., Anatomy Lab) and develop more anatomy labeling projects involving students. These projects may be followed by reviews at multiple levels by experts and physicians. This can be directly used in education and courses.
- **Analyzing Apple Vision Pro or Meta Quest Pro as alternative headsets:** Apple Vision Pro offers better computational power and provides more precise images. The quality comes at higher cost: $3,500 each plus prescription eyewear for $100 if it's customized to an individual. Visage is a compatible software program for virtual anatomy. The Meta Quest Pro offers robust AR and VR capabilities at a more accessible price point at $800 ea.
- **Headset sharing with other programs:** 10 HoloLens headsets will be transferred to the School of Nursing for their extended reality anatomy program integrated with a course for Master of Nursing students.

Share your thoughts: Yale School of Medicine Educational Technology & Innovation Team at Innovate.MedEd@yale.edu

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