

CITATION OF  
**ANDREW TEIXEIRA**  
FOR THE  
**ROMEO L. MORUZZI YOUNG FACULTY AWARD**  
FOR INNOVATION IN UNDERGRADUATE EDUCATION

On paper, in simulations, even while watching video demonstrations, operating a distillation column seems as simple as defining a temperature and monitoring the output in the distillate. But without physically being present, it is challenging to convey the gravity, complexity, and intertwined nature of each valve, fitting, or probe needed to achieve that outcome. In the Unit Operations lab, students stand in front of enormous columns and physically and cognitively make those connections.

But in the era of COVID-19, this all changed, challenging the Chemical Engineering faculty to help both remote and in-person students make those connections. Andrew Teixeira rose to the challenge and, with the support of his colleagues, designed and delivered an experience for students that not only accommodated WPI's TechFlex model, but also generated a teaching and learning model for the future.

With the introduction of pan-tilt-zoom cameras, augmented reality glasses, and a software interface, remote students, local students, and faculty were synchronously brought together in real time. The AR glasses worn by students in the lab broadcast what the wearer saw to the online partner. With PTZ cameras, remote students could pan around the lab and see what their colleagues were doing. At the same time, everyone could work on virtually located spreadsheets, diagrams, and calculations.

One of Andrew's colleagues noted another benefit. The exercise supported a re-evaluation of the laboratory learning outcomes, resulting in changes to equipment and experiments to make the experience more relevant to a changing industry.

Another colleague saw the benefit of providing student interactions during a time when courses were filled with Zoom screens and students in remote silence ... "It was great to hear chatter. Remote and local students were talking in groups about the equipment, communicating results, asking questions—they were having fun and learning."

Andrew himself notes that the future of hybrid, remote, and self-driven learning will require development of methods to meet and exceed the challenges of delivering excellence in applied, experiential engineering education.

For his willingness to meet that challenge and for his innovative use of technology to enhance student learning and position WPI as a leader in remote laboratory operation that will outlast the pandemic, we are proud to present the 2021 Romeo L. Moruzzi Young Faculty Award for Innovation in Undergraduate Education to Professor Andrew Teixeira.

**WORCESTER POLYTECHNIC INSTITUTE**  
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