Imagining the Future of Undergraduate STEM Education

The National Academies of SCIENCES ENGINEERING MEDICINE

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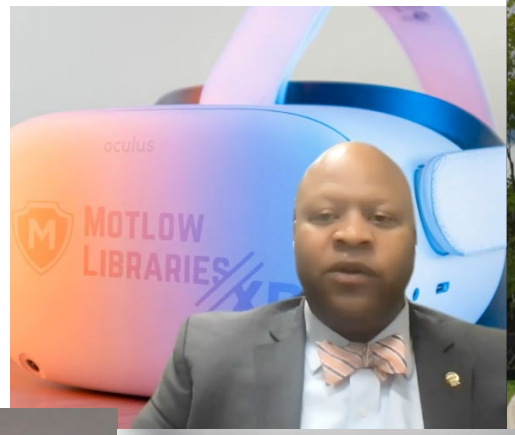
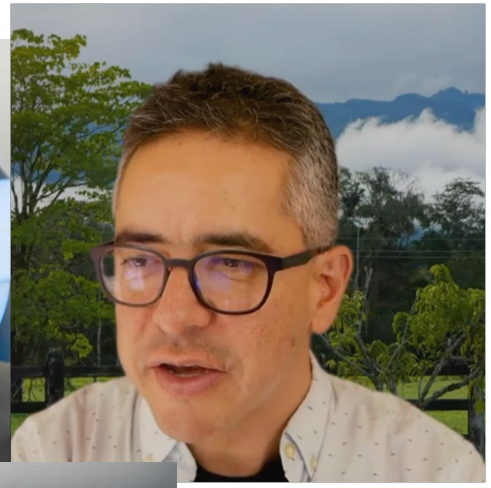
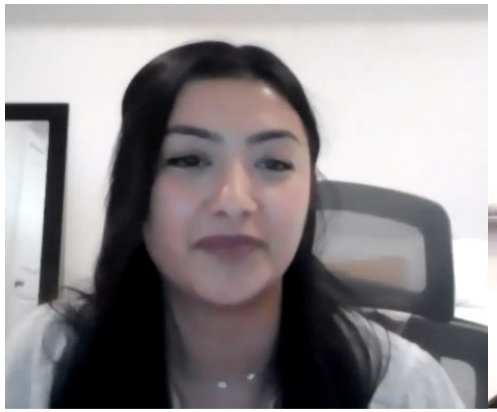
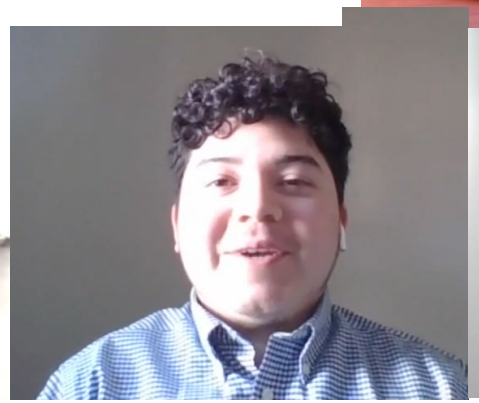
#STEMFuturesHigherEd

Technology and the Future of Undergrad STEM Education









Higher education institutions will have to change

"Improvement in post secondary education will require converting teaching from a solo sport to a community-based research activity." -- Herbert Simon

Risks and Challenges

- Risk: we will perpetuate unequal access to technologies in undergraduate STEM education
- Risk: Technology complexity has increased, making it hard to navigate and manage
- Challenge: Difficult to effectively center technology on undergrade STEM student needs
- Challenge: Need incentives for faculty to develop, refine, and integrate technology
- Challenge: Need incentives across institutions (and partnerships)
- Challenge: Major impediments due to short-term financial issues and viewpoint
- Challenge: two year (community) colleges are critical yet have additional constraints

Opportunities

- Cloud computing has been transformative (helps to level the playing field for students)
- Costs for technology have plummeted (people costs now dominate)
- Great potential for technology designed to allow students to exercise their agency
- Considerable wisdom available from the learning sciences
- Can build on results from what worked (and what didn't) during the pandemic
- Opportunities for creative models to scale sustainable change
- Huge unmet need: technology with equity and social justice mindset