THE POWER OF VIRTUAL REALITY FOR PHYSICS (AND STEM) EDUCATION

John Debs

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ABSTRACT

While there has been much hype around VR in education, there has been limited research around what is truly novel about the technology. This workshop will share best practice around the how and why Virtual Reality can be used to enhance student learning in Physics education. Inspired by the Force Concept Inventory (FCI), we developed a novel app at ANU that asks students what forces act on a basketball, and then presents them with the physical world based on their answer. This allows student to experience unphysical worlds that manifest their misconceptions around forces. Guided by a narrator, students reflect on their answers to correct their misconception.

Participants of this workshop will hear about the positives and challenges of using highly immersive VR in education, including recent research that demonstrates its effectiveness with over 150 students. They will also experience the learning journey of students, including taking the FCI, watching a live demo of the VR experience, then a chance to retake the FCI. The workshop will conclude with a facilitated discussion around other ways VR might be useful in Physics education, including a second demo of our EM-field VR simulator.

Intended Audience: Undergraduate and Secondary-School Physics Educators

PRESENTER

Dr. John Debs is a quantum physicist and passionate educator with a history of prosecuting innovative approaches in physics education. He believes that people learn by doing and uses inquiry-based approaches with open-ended lab ‘challenges.’ This encourages students to solve problems by designing their own experiments, which solidifies theoretical concepts. Led by this, John founded and heads the ANU MakerSpace – an interdisciplinary space for project-based learning and research. John has been recognised for his work with an Australian Award for Teaching Excellence, and most recently, he has developed novel applications using highly immersive virtual reality to help students correct misconceptions in first-year physics.

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