

## **Modeling Instruction: A Transformative way to experience STEM content**

Idaykis Rodriguez

STEM Transformation Institute

Florida International University

**Abstract:** Active learning pedagogies have been found to be more effective than lecture approaches (Freeman et al 2014). Modeling Instruction in University Physics is an evidence-based, active learning, student-centered, curricula that transforms the way students experience STEM content. Focused around *doing* science, students engage in cooperative group learning, whole-class discussion, and develop theoretical models of physical phenomena with little to no lecture time. This talk will focus on explaining how to create an introductory physics experience that is culturally sensitive and inclusive of students that are traditionally under-represented minorities in STEM and transforming students conceptions of physics. At Florida International University, a majority Hispanic Serving Institution, we have been practicing Modeling Instruction for the last 15 years, where in the last 5 years, Modeling Instruction is scaled to large 100 person classes. The success of Modeling Instruction is reflected in a 14% difference in student conceptual understanding as measured by the standardized diagnostics when compared to lecture courses, a 6.73 times greater odds of success, and an equally likely survival rate for Modeling Instruction students that become physics majors to succeed in their upper level program when compared to lecture students. The general success of this course has led us to rethink and redesign STEM experiences for students that are tailored to their educational and individual needs.

**Bio:** Idaykis Rodriguez holds a doctorate degree in physics with specialization in Discipline Based Education Research. She is currently a physics instructor teaching a highly active learning introductory physics course using Modeling Instruction curriculum. Her particular research interest span the intersection of students cultural identity and the perceived culture of higher education enacted in active learning STEM classrooms. She has various peer-reviewed publications featuring her expertise in both qualitative and quantitative research methodology.