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Adopting Modeling Instruction in establishing supportive environments for traditionally underrepresented students ERIC BREWE, LAIRD KRAMER, GEORGE O'BRIEN, Florida International University — We describe Florida International University's adoption of Modeling Instruction as a foundation of reform for the physics department. Modeling Instruction is a reformed pedagogy that has been central to creating a supportive learning environment for traditionally underrepresented student in physics. Multiple measures have shown the impact of the reform, including improved conceptual understanding, enhanced attitudes toward science and learning science, and more broadly improved recruitment, retention, and persistence in physics as a major. We report FCI scores for students in Modeling Instruction and compare them with traditionally taught students. Modeling students outperform traditionally taught students on post instruction FCI (64.9% vs. 48.3%, $p<0.001$). FCI scores further disaggregated by ethnicity and by gender also show marked improvement. Overall persistence in Modeling classes is four times better than in traditional classes, as measured by DFW rates for introductory physics, and for traditionally underrepresented groups. Numbers of majors and graduation rates have also increased as these reforms have been established. Together these measures indicate that we have established a supportive learning environment for traditionally underrepresented students, thus creating a model for increasing participation in physics by all students.

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