

Modeling Instruction in AP Physics C: Mechanics and Electricity and Magnetism

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Abstract

This action research study used data from multiple assessments in Mechanics and Electricity and Magnetism to determine the viability of Modeling Instruction as a pedagogy for students in AP Physics C: Mechanics and Electricity and Magnetism. Modeling Instruction is a guided-inquiry approach to teaching science in which students progress through the Modeling Cycle to develop a fully-constructed model for a scientific concept. AP Physics C: Mechanics and Electricity and Magnetism are calculus-based physics courses, approximately equivalent to first-year calculus-based physics courses at the collegiate level. Using a one-group pretest-posttest design, students were assessed in Mechanics using the Force Concept Inventory, Mechanics Baseline Test, and 2015 AP Physics C: Mechanics Practice Exam. With the same design, students were assessed in Electricity and Magnetism on the Brief Electricity and Magnetism Assessment, Electricity and Magnetism Conceptual Assessment, and 2015 AP Physics C: Electricity and Magnetism Practice Exam. In a one-shot case study design, student scores were collected from the 2017 AP Physics C: Mechanics and Electricity and Magnetism Exams. Students performed moderately well on the assessments in Mechanics and Electricity and Magnetism, demonstrating that Modeling Instruction is a viable pedagogy in AP Physics C: Electricity and Magnetism.

Keywords: Modeling Instruction, AP Physics C, action research