

Abstract Submitted  
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**How Active Learning Affects Student Understanding of Concepts in Electromagnetism**<sup>1</sup> JOHN BELCHER, Massachusetts Institute of Technology, JUDY DORI, Technion, LORI BRESLOW, Massachusetts Institute of Technology — We discuss the effects of the learning environment of the MIT TEAL project on student cognitive and affective outcomes in introductory electromagnetism. Our assessment included examining student conceptual understanding before and after studying electromagnetism in a media-rich environment. We developed pre-and posttests consisting of conceptual questions from standardized tests, as well as questions designed to assess the effect of visualizations and experiments. The research population consisted of 811 undergraduate students, consisting of small-and a large-scale experimental group and control group. The active learning students improved their conceptual understanding of the subject matter to a significantly higher extent than their control group peers. A subsequent longitudinal study indicates that the long-term effect of the TEAL course on student retention of concepts was significantly stronger than that of the traditional course.

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