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Replicating Physics Education Reforms: How (and why) to keep a good thing going.[1]

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What does research tell us about dealing with the large introductory physics classes that are a fact of life at so many Universities? In particular, what does it mean to successfully replicate course transformations, between or within institutions? We report on our efforts to implement several widely studied PER-based transformations, including peer instruction and Washington Tutorials[1], and show how and why (some) educational reforms and research can transfer successfully. In successive semesters with multiple instructors, we measure results similar to those seen by the original authors of the reforms - namely, significantly improved conceptual mastery. We also document the support of productive attitudes and beliefs, albeit with some student discontent. We examine our data from a theoretical perspective involving several levels: tasks, situations, and broader educational structures. We find each of these layers, and their interplay, are critical in the successful implementation of these reforms. This framework may prove useful for understanding and adapting features that shape when and why a given implementation might be successful and sustainable.

[1] McDermott, L. and Shaffer, P.,"Tutorials in Introductory Physics," Prentice Hall 2002.

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