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Sustainable and Scalable Reforms in Physics Education: Research studies from Colorado PhysTEC

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and STEVEN POLLOCK University of Colorado at Boulder – While many practices developed within the physics education research community have been demonstrated as successful, they respond to calls and employ practices that echo efforts from the early part of the 20th Century. Are we bound to the same limited success as these precursors? We examine what it means to replicate proven reforms and to develop models for sustainable implementation of these reforms. As part of the Colorado Physics Teacher Education Coalition, we have implemented the Tutorials in Introductory Physics, which were developed by researchers at the University of Washington. We present research on the successful implementation of these reforms at the University of Colorado and begin to answer the questions: What does it mean to replicate an educational program? and How might these educational transformations be sustained? We present empirical data on the success of reforms and the fidelity of implementation as well as theoretical frames for analyzing these data. We also present a model (the Learning Assistant program) designed for sustaining these reforms and for increasing student interest and retention in teaching.