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Assessment of Student Learning in Modern Experiments in the Introductory Calculus-Based Physics Labs BRIAN WOODAHL, JOHN ROSS, SARAH LANG, DEREK SCOTT, JEREMY WILLIAMS, IUPUI — With the advent of newer microelectronic sensors it's now possible to modernize introductory physics labs with the latest technology and this may allow for enhanced student participation/learning in the experiments. For example, force plate sensors can digitize and record the force on an object, later it can be analyzed in detail (i.e, impulse from force vs. time). Small 3-axis accelerometers can record 3-dim, time-dependent acceleration of objects undergoing complex motions. These devices are small, fairly easy to use, and importantly, are likely to enhance student learning by “personalizing” data collection, i.e. making the student an active part of the measurement process and no longer a passive observer. To assess whether these new high-tech labs enhance student learning, we have implemented pre- and post- test sessions to measure the effectiveness of student learning. Four of our calculus-based lab sections were used: Two sections the control group, using the previous “old technology” labs, the other two, the experimental group, using the new “modern technology” labs. Initial returns of assessment data offer some surprising insight.

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