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What Are Students Learning, and From What Activity?

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What knowledge are students learning? If so, what instructional activities are they learning from? What student habits are helpful or detrimental to learning? What learning do they remember at graduation? We must be able to answer these questions in order to improve our educational process scientifically. Fortunately the use of electronic tutors and electronic data recording in more traditional courses makes available data that answer some of these questions. I will also describe a software tutor that really helps students learn. Finally I shall address a key question - what do we really want students to learn? Given that most teachers want students to become more expert-like, I will describe a pedagogy, "Modeling Applied to Problem Solving" that has achieved this result. These studies were done in introductory college physics. For a preview of the research see <http://relate.mit.edu>