APR07-2007-000949

Abstract for an Invited Paper
for the APR07 Meeting of
the American Physical Society

Improving student learning in physics: The challenge of identifying effective instructional strategies[1]

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It is by now well known that many students leave physics courses expressing essentially the same (incorrect) ideas with which they entered. It is frequently assumed that these prior conceptions can be identified and then addressed through "interactive engagement" strategies such as hands-on activities, the use of "clickers" in the lecture hall, and small-group collaborative work. But is it that simple? In many cases it is difficult to identify specific tasks that will help students overcome serious and persistent conceptual difficulties. I will illustrate the process of identifying effective instructional strategies with a few examples and argue that topic-specific research on student understanding is crucial for improving instruction.

[1]Supported by NSF