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Inside Out: Active learning in fluid dynamics in and out of the classroom NIGEL KAYE, LISA BENSON, BEN SILL, Clemson University — Active learning can be broadly defined as any activity that engages students beyond just listening. But is it worth the effort, when we can just lecture and tell students all they need to know? Learning theories posit that students remember far more of what they say and do than of what they hear and see. The benefits of active learning include increased attendance (because class is now something different and attending is more worthwhile) and deeper understanding of concepts (because students get to practice answering and generating questions). A recent meta-analysis of research on active learning has summarized evidence of real outcomes of active learning. Research is showing that students' performance on exams are higher and that they fail at lower rates in classes that involve active learning compared to traditional lecturing. Other studies have shown evidence of improved performance in follow-on classes, showing that the improved learning lasts. There are some topics and concepts that are best taught (or at least introduced) through lecturing, but even lecturing can be broken up by short activities that engage students so they learn more effectively. In this presentation, we will review the findings of the meta study and provide examples of active learning both inside and outside the classroom that demonstrate simple ways of introducing this approach in fluid dynamics classes.

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