USC Center for Excellence in Teaching

# Active learning

## WHAT IS THIS RESOURCE?

A selection of literature resources discussing the impacts of active learning on student learning.

**Deslauriers, L., Schelew, E., & Wieman, C. (2011). Improved learning in a large-enrollment physics class.(REPORTS)(Author abstract)(Report). *Science, 332*(6031), 862–864.**[**https://doi.org/10.1126/science.1201783**](https://doi.org/10.1126/science.1201783)

Demonstrates increased student attendance, higher engagement, and more than twice the learning in Physics section taught using research-based instruction by an inexperienced instructor, compared to traditional lecture by an experienced instructor. The instructional approach used in the experimental section included pre-class reading assignments and pre-class reading quizzes (flipped class), in-class clicker questions with student-student discussion, small-group active-learning tasks, and targeted in-class instructor feedback.

**Freeman, S., Eddy, S., McDonough, M., Smith, M., Okoroafor, N., Jordt, H., & Wenderoth, M. (2014). Active learning increases student performance in science, engineering, and mathematics.(PSYCHOLOGICAL AND COGNITIVE SCIENCES)(Report)(Author abstract). Proceedings of the National Academy of Sciences of the United States, 111(23), 8410–8845.**[**https://doi.org/10.1073/pnas.1319030111**](https://doi.org/10.1073/pnas.1319030111)

Meta-analysis. The studies analyzed here document that active learning leads to increases in examination performance that would raise average grades by a half a letter, and that failure rates under traditional lecturing increase by 55% over the rates observed under active learning.

**Hake, R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics, 66*(1), 64–74.**[**https://doi.org/10.1119/1.18809**](https://doi.org/10.1119/1.18809)

Statistically analyzes student pre- and post- course data to prove that student engagement and interaction methods are approximately 2x as effective as traditional lecture.

**Pascarella, E., & Terenzini, P. (2005). *How college affects students : a third decade of research* (1st ed.) (pp. 101-2). San Francisco: Jossey-Bass.**

Cognitive gains through active learning reviewed.

**Prince, M. (2004). Does Active Learning Work? A Review of the Research. *Journal of Engineering Education, 93*(3), 223–231.**[**https://doi.org/10.1002/j.2168-9830.2004.tb00809.x**](https://doi.org/10.1002/j.2168-9830.2004.tb00809.x)

Reviews literature support for groupwork/collaboration, problem-based learning, and active learning (in contrast to lecture).