

Demonstrations

Do students learn by watching demonstrations?

“Lecture demonstrations have two important purposes: to increase student understanding of the concepts demonstrated, and to increase student enjoyment of class. Previous studies have cast doubt on whether traditional demonstrations accomplish the first, finding that passive observation of demonstrations does not significantly improve student understanding of the associated concepts. Indeed, many students alter their memory of demonstrations to match their ideas about the underlying physics!

Does the presentation of a demonstration affect its effectiveness? If students are required to predict the outcome of a demonstration and discuss their predictions with one another before the demonstration, they think more actively about the demonstration and its explanation, and have opportunities to discover inconsistencies or weaknesses in their own thinking. We are studying whether this strategy improves student understanding of the demonstration.

We identified four possible modes of demonstration presentation:

- no demonstration
- show and tell (traditional approach)
- predict (students predict the outcome individually before seeing the demonstration)
- predict and discuss (students predict the outcome individually, then discuss their predictions with others, before seeing the demonstration)

Each demonstration was presented to part of the class in each of these modes during discussion sections.

At the end of the semester, we gave a free-response test in which students were asked to predict and explain the outcome of physical situations similar or identical to the demonstrations. Initial analysis suggests a small improvement in performance when students have to predict the outcome of a demonstration before seeing it; follow-up studies are in progress.”

Copied from Mazur Group (<http://mazur.harvard.edu/research/detailspage.php?rowid=10>):

Online resources for demonstrations:

Wolfram Demonstrations Project – www.demonstrations.wolfram.com

You Tube Videos

Khan Academy

<http://www.ph.utexas.edu/~phy-demo/resources/resources.html>

- <http://www.brown.edu/academics/physics/courses/lecture-demos/lecture-demos>
- <http://physicslearning.colorado.edu/ldl/>
- <http://www.phys.ufl.edu/demo/>