

Scientific Teaching: “I wasn’t trained as a teacher, how can Scientific Teaching help me?”  
Teaching Mentoring Program Sponsored by the CVM Teaching Academy

Readings and Resources:

Revisiting “Is the scientific paper a fraud?” at <http://embor.embopress.org/content/15/5/481.long>

This paper re-examines the basic research premise of scientific papers and research and can be considered a distinct departure from the K-12 process of science education.

Anyone? Anyone? At <https://www.youtube.com/watch?v=dxPVyieptwA>

This clip shows an 80’s clip of a terrible economics lecture. While this is not what we are talking about when considering the role of lecture and active learning, there are some talking points in here. (from models of learning p. 4-8; constructivism and ‘cross the Rubicon’ of Marzano)

Gathering evidence in scientific teaching:

Bloom’s Taxonomy: at [http://ww2.odu.edu/educ/roverbau/Bloom/blooms\\_taxonomy.htm](http://ww2.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm)

This provides information on the original and updated (1990) version of Bloom’s Taxonomy with sufficient definitions to facilitate writing student learning outcomes.

A model of learning objectives: at <http://www.celt.iastate.edu/teaching-resources/effective-practice/revised-blooms-taxonomy/>

This provides a powerful visual representation of taxonomy along the dimensions knowledge and cognitive process. A nice resource for examples of metacognition across knowledge spectrum.

Tips on writing good learning objectives: at <http://www.celt.iastate.edu/teaching-resources/course-planning/syllabi/writing-learning-objectives/>

This is a nice short primer which includes sufficient background, examples and many verbs mapped to each level of the cognitive domain.

Assessment primer: learning taxonomies: at <http://assessment.uconn.edu/primer/taxonomies1.html>

This includes a characterization of the cognitive domain balance between upper division and lower division courses, affective domain, and psychomotor domain.

About teaching:

Knight, & Wood (2005). Teaching More by Lecturing Less in Cell Biology Education: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1305892/pdf/i1536-7509-4-4-298.pdf>

Provides some evidence to support learning gains between groups.

Schwerdt & Wuppermann (2011). Sage on the Stage is Lecturing Really All That Bad? At: <http://educationnext.org/sage-on-the-stage/>

Provides some evidence that lecture format is efficient in meeting some learning objectives.

Udovic, Morris, et al. (2002). Workshop Biology: Demonstrating the Effectiveness of Active Learning in an Introductory Biology Course: [http://pages.uoregon.edu/udovic/Pubs/UdovicEtAl\\_2002.pdf](http://pages.uoregon.edu/udovic/Pubs/UdovicEtAl_2002.pdf)

Provides some evidence to support learning gains.

Leight, Saunders, (2012) Collaborative Testing Improves Performance but not Content Retention in a Large-Enrollment Introductory Biology Class:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3516795/pdf/392.pdf>

Provides an example of how the question of interest can determine the method used.