

Transforming Undergraduate Biology: Assessing Student Learning

This draft is the beginning of a working bibliography of key reference materials for the student assessment topical area. Charles "Andy" Anderson, Michigan State University; Diane Ebert-May, Michigan State University; Nancy Pelaez, Purdue University

Allen D, Tanner K. (2002). Approaches to cell biology teaching: questions about questions. *Cell Biol Educ.* 1(3):63-7.

Anderson, C. W., Sheldon, T. H., & Dubay, J. (1990). The effects of instruction on college non-majors' conceptions of respiration and photosynthesis. *Journal of Research in Science Teaching*, 27 (8), 761-776.

Anderson, D. L., K. M. Fisher, and G. J. Norman (2002). Development and evaluation of the Conceptual Inventory of Natural Selection. *Journal of Research in Science Teaching* 39:952-978.

Arter, J.A., and McTighe, J. (2001). *Scoring Rubrics in the Classroom: Using Performance Criteria for Assessing and Improving Student Performance*. Thousand Oaks, CA: Corwin Press.

Banta, T.W. *Assessment Methods at Classroom, Unit, and University-wide Levels*. Indiana University-Purdue University Indianapolis. [PDF Version Accessed July 1, 2009 Online at <http://www.bmcc.cuny.edu/iresearch/upload/Banta.pdf>]

Batzli J.M., Ebert-May D., and Hodder J. (2006). Bridging the pathway from instruction to research. *Front Ecol Environ* 4(2):105-107.

Bishop, B. A., and Anderson, C. W. (1990), Student conceptions of natural selection and its role in evolution. *Journal of Research in Science Teaching*, 27, (5), 415-427.

Bowling B.V., Acra E.E., Wang L., Myers M.F., Dean G.E., Markle G.C., Moskalik C.L., Huether C.A. (2008). Development and Evaluation of a Genetics Literacy Assessment Instrument for Undergraduates. *Genetics* 178(1):15-22.

Bray Speth, E, Pennock, R, Long, TM, and Ebert-May, D. (2009, in press). Using Avida-ED for teaching and learning about evolution in undergraduate introductory biology courses. *Evolution: Education and Outreach*. [available soon at <http://www.springerlink.com/content/120878/>]

Center for Teaching and Learning (1993). You Know Where Your Students Are? Classroom Assessment and Student Learning. *Stanford University Newsletter on Teaching* 4(2):1-4. [PDF Version Accessed July 10, 2009 Online at http://ctl.stanford.edu/Newsletter/do_you_know.pdf]

Ebert-May D, Batzli J, and Weber E.P. 2006. Designing research to investigate student learning. *Front Ecol Environ* 4(3):218-219.

D'Avanzo, C. (2008) Biology Concept Inventories: Overview, Status, and Next Steps. *Bioscience* 58 (11):1079-1085

Gardiner, L. F. (1998). Why We Must Change: The Research Evidence. *NEA Higher Education Journal* <http://www2.nea.org/he/heta98/images/s98pg71.pdf>

Gauci S.A., Dantas A.M., Williams D.A., Kemm R.E. (2009). Promoting student-centered active learning in lectures with a personal response system. *Adv Physiol Educ.* 33(1):60-71.

Gehring, K.M. and D.A. Eastman (2008). Information Fluency for Undergraduate Biology Majors: Applications of Inquiry-based Learning in a Developmental Biology Course. *CBE Life Sci Educ* 2008 7: 54-63.

Gerdeman, R.D., A.A. Russell, K.J. Worden (2007). *Journal of College Science Teaching* 36:46-53.

Hodder J, Ebert-May D, Batzli J. (2006). Coding to analyze students' critical thinking. *Frontiers in Ecology and the Environment* 4(3):162-163.

Hoskins, S.G., L.M. Stevens, and R.H. Nehm (2007). Selective Use of the Primary Literature Transforms the Classroom Into a Virtual Laboratory. *Genetics* 176: 1381-1389.

Margulies, B. J. and Ghent, C.A. (2005). Alternative Assessment Strategy and Its Impact on Student Comprehension in an Undergraduate Microbiology Course. *Microbiology Education* 6:3-7.

McGonigal, K. (2006). Getting more Teaching out of Testing and Grading. *Stanford University Newsletter on Teaching* 15(2):1-4. [PDF Version Accessed July 10, 2009 Online at http://ctl.stanford.edu/Newsletter/testing_grading.pdf]

Michael, J. A. (1998). Students' misconceptions about perceived physiological responses. *Advances in Physiological Education* 19:90-98.

Nehm, R. H. and L. Reilly. (2007). Biology majors' knowledge and misconceptions of natural selection. *BioScience* 57:263-272.

Reynolds, J. and C. Moskovitz (2008). Calibrated Peer Review Assignments in Science Courses: Are They Designed to Promote Critical Thinking and Writing Skills? *Journal of College Science Teaching* Nov/Dec 2008, pp 60-66.

Sharp S.E., Elder B.L. (2004). Competency assessment in the clinical microbiology laboratory. *Clin Microbiol Rev.* 17(3):681-94.

Shulman, Lee (2002) Making Differences: A Table of Learning, *Change* 34 (6): 36-44. [HTML Version Accessed July 1, 2009 Online at <http://www.carnegiefoundation.org/publications/sub.asp?key=452&subkey=612>]

Smith M.K., Wood W.B., Knight J.K. (2008). The Genetics Concept Assessment: a new concept inventory for gauging student understanding of genetics. *CBE Life Sci Educ.* 7(4):422-30.

Tanner K, Allen D. (2005). Approaches to biology teaching and learning: understanding the wrong answers--teaching toward conceptual change. *CBE Life Sci Educ.*4(2):112-7.

Tanner, K., and Allen, D. (2004). From assays to assessments: on collecting evidence in science teaching. *CBE Life Sci Educ.* 3(3), 69-74.

Ward, H. and Hockey, J. (2007) Engaging the learner: Embedding information literacy skills into a biotechnology degree. *Biochemistry and Molecular Biology Education* 35(5):374 - 380.

Wiggins, G. (1998). *Educative assessment: Designing assessments to inform and improve student performance.* San Francisco: Jossey-Bass.

Wilson, C. D., C. W. Anderson, M. Heidemann, J. E. Merrill, B. W. Merritt, G. Richmond, D. F. Silbey, and J. M. Parker (2006). Assessing students' ability to trace matter in dynamic systems in cell biology. *CBE Life Sci Educ.* 5:323–331.

Wood, W.B. (2004). Clickers: a teaching gimmick that works. *Dev. Cell* 7, 796–798.

Wright RL. (2005). Content versus process: is this a fair choice? Undergraduate biology courses for nonscientists: toward a lived curriculum. *CBE Life Sci Educ.* 4(3):189-96.