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Evidence-Based Teaching Strategies: Assessment of Student Learning in the College Science Classroom

Karen Sirum

Bowling Green State University, Department of Biological Sciences, 202 Life Sciences Bldg, Bowling Green OH 43403 USA
(**ksirum@bgsu.edu**)

Introductory science classes serve as gateway, facilitating student interest and recruitment to the sciences and scientific ways of thinking, or alternatively, turning students away from the sciences as a major, an area of interest, and even as a value in everyday life. Undergraduate science education goals include development of students' scientific thinking skills, valuing evidence and the propensity to use these skills and values in decision-making. How do we know if we are creating learning opportunities that promote achievement of these goals in our classrooms and teaching laboratories? Assessment of student learning involves approaching teaching scientifically, based on the research on how people learn and employing methods and measures to find out if such approaches promote the desired learning outcomes. Interactive Engagement (IE) teaching strategies include methods to facilitate student interaction with not only the course content and with the instructor, but also among students - the benefits to student learning are well documented. A key feature of IE is that it provides frequent opportunities for assessment, providing feedback to the student and to the instructor on student learning. IE pedagogical approaches include peer instruction, active, problem-based, cooperative, and collaborative learning, strategies that are effective not only for the teaching laboratory, but also for the large and small enrollment lecture section of courses. In this workshop session, participants learn about IE by actually doing it, and share ideas about group work as an instructional strategy, including ideas about how technology can be used to make it more effective. In addition, practical, readily implementable ideas for assessing learning are discussed. While "assessment" is often one of the "seven dirty words you can't say at a faculty meeting," when fundamentally applied to the classroom, assessment is an obvious utilization of our science research skills.

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