

Campus Assessment of Student Learning Outcomes

Unit Name: Department of Biology Assessment Summary Fall 2010-Spring 2011

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Chair: Dr. Spencer Cortwright

Describe the assessment plan and procedures currently in place in your unit, noting the specific outcomes measured, measurement tools used, and parties responsible for collection, analysis, and action.

Note: include the full 'loop' of assessment from student learning outcome through targets for improvement and change.

The Department of Biology has four primary student learning outcomes for our Majors:

1. Students will obtain a firm foundation and advanced study in all important sub-fields of biology.
2. Students will learn critical evaluation of new scientific results and incorporate key findings into their base of knowledge.
3. Students will conceive and perform biological experiments that include data collection, data analysis and interpretation, and synthesis of findings.
4. Students will learn effective communication via scientific writing of research reports, essay exams, and grants; and via oral presentation of scientific studies.

We assess these goals in the following ways.

Capstone Course – This is a generally small, senior-level course that requires students to demonstrate in-depth scientific achievement. Students must master reading and comprehension of primary literature in preparation for exams, must write a detailed paper focusing on use of primary literature, and must make connections among a wide variety of sub-fields in Biology on exams. Because of the small size of the class, student achievement on these counts is readily monitored and course goals emphasized.

Upper-Level Exams – Each course features exams using a variety of short answer and essay questions that address student skills in the four outcomes.

Senior Seminar – This seminar varies from one semester to another, but either requires students to prepare a grant proposal or present an oral presentation of a primary research project (actual research or literature research).

GPA & Standardized Test Scores – We ask students to volunteer information on their professional test scores (e.g. MCAT, DAT, GRE, etc.), which we compare to GPA. We seek a positive correlation between the two and over the past 15 years we have been pleased with the correlation. More thorough record-keeping can firm our interpretations of the trend.

The department also serves Nursing and Allied Health students. We frequently discuss how students are performing in these classes, with the goal of identifying any needed adjustments to the curriculum. For example, in our Anatomy & Physiology courses we keep close track of DWF rates and institute course changes as perceived necessary. Addition of discussion sections is one way we have modified our anatomy and physiology courses.

Breath of Learning Outcomes (nonmajors). In spring 2011 we assessed student learning achievement of the scientific method as an important metric of success in breath of learning. We used the final lab exam as our tool for assessment. We had 6 questions on the scientific method (both in general and in regard to specific science experiments). For ca. 33 students we compared % correct on scientific method questions compared to “content” questions on the rest of the exam and found that % correct was statistically the same. This suggested that students learned the scientific method as well as they did scientific content. However, both percentages were low (upper 60's%), so we need improvement on both counts. For spring 2012 we plan to have questions on the scientific method on both mid-term and final lab exams and compare performance. We aspire to improved % correct on the final compared to the mid-term.

Chart/describe the data collection, analysis, and reporting cycles in your unit assessment plan.

Assessment Activity	Method	Responsible Party	Timetable
Evaluation of theoretical concepts per dept. student learning goals	In-depth short answer or essay tests, research papers, laboratory exercises with lab reports, capstone papers/projects	Dept. chair & full-time faculty work together	Assessment info discussed at monthly dept. meet.
Evaluation of applied concepts, per dept. student learning goals	Some course projects have applied applications. Students earn internships, discussions with students.	Dept. chair & full-time faculty work together	Same as above
Evaluation of research and analytical skills per dept. student learning goals	Lab & field exercises, independent research projects, both of which require written scientific papers and/or scientific presentations	Dept. chair & full-time faculty work together	Same as above
Critical evaluation of biological research, per dept. student learning goals	Capstone course requires intensive critical analysis of primary literature research on exams and in research papers	Dept. chair & full-time faculty work together	Same as above
1-2 new improvement target areas suggested for next yr. – congruent with dept., gen ed, & campus student learning outcomes	Dept. meetings will continue focus on student success in L101. Survey data correlate with DWF rate, so we will plan course adjustments accordingly.	Dept. chair & full-time faculty work together	New efforts discussed during 10-11 year

In one brief paragraph, indicate the data you collected and the results (what specifically did your assessment yield for the things you worked to improve?)

During 08-09 and 09-10 we implemented a survey taken by our L101 classes. The survey featured 10 questions of fundamental scientific and biological knowledge (now upped to 20). We found that a score of 6 correct or lower correlated well with DWF rate. For example, in fall of 2010, eight students did not take our advice to take L100 as a prep for L101. Of those eight, only one earned a grade

allowing one to move on to L102, and that was a C-. Other students did take our advice as they switched to L100. We will aim to track their success in L101 in Spring 2011. During Fall 2011, we instituted a requirement that students score 70% or better on the survey. At the end of this semester we will see if DWF rate is lower for L101, which would suggest that proper placement does improve success. In addition DWF for Spring 2012 also should be lower, as that is when students who took L100 are most likely to take L101.

We find that C- or better rates in L211 approach 60%, so once students make it through the freshman sequence, they do better though not yet acceptably so. We continue to explore options to enhance the percentage of students making it through L101 with a C- or better. One presently under discussion is to employ more writing in discussions with the aim of urging more dedicated study time if they know they'll have to demonstrate understanding in writing, not just on multiple choice exams.