

2009-10 Program Assessment Update

Department & Program: BIOLOGY – BS & BAE

submitted by: Margaret A. O'Connell & Heather McKean

1. Student Learning Outcome	2. Strategy or method of measurement	3. Observations gathered from data	4. Actions recommended based on observations	5. Plan and timetable for taking action	6. Overall evaluation of progress on objective
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<p>BS in Biology: Students will become proficient in oral communication about biology in general and their research area in particular.</p>	<p>Oral Presentations from BIOL 270, Investigating Biology, and BIOL 490, Animal Physiology and Microbial Physiology were assessed during Spring 2010. In all classes, students conduct group research projects. Oral presentations are incorporated with an initial oral presentation of research proposal and with a final oral presentation of research results. These presentations can be in conjunction with either a poster presentation or a PowerPoint presentation. In both cases students must articulate their research approach and results. This past spring the BIOL 270 posters were also included as part of our biweekly seminar program, so students had to discuss their research in front of faculty and upper division and graduate students. The BIOL 270 is part of our introductory sequence and the BIOL 490 is our Senior Capstone; therefore, assessment of presentations in these courses gives information about students early and again late in the program.</p> <p>Oral presentations at both levels require students present general biological background information.</p>	<p>Introductory Level: 1) Data on oral presentations were gathered from all 3 sections of class (74 students). 2) The mean grade on final presentations (83.6%; 66-95%) indicated that students were learning basics of presentations. Having students present their findings to diverse audience of faculty and other students helps them learn to adjust presentation to different levels.</p> <p>Capstone Level: 1) Data on oral presentations were gathered from capstone classes (60 students). The mean grade on final presentations (93%; 75-100%) indicated that capstone students had improved scores compared to introductory students.</p>	<p>Introductory Level: 1) provide students with more practice sessions; 2) have students attend bi-weekly department seminars and graduate seminars.</p> <p>Capstone Level: 1) One instructor for the course incorporated a peer-review panel of group study designs and found that this improved final product and, hence, presentations. Other instructor will do so; 2) Refine scoring rubrics.</p>	<p>Introductory Level: These actions will be incorporated into the sections that these faculty teach in upcoming quarters and the results will be reported to other faculty who teach in these introductory and capstone classes.</p>	<p>Oral communication of biology, in general, and of research, in particular, is an important SLO.</p>

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<p>BAE in Biology: Construct and use effective assessment strategies to determine the backgrounds and achievements of learners and facilitate their intellectual, social and personal development.</p>	<p>All students who receive the BAE in Biology must take two courses in science methods (SCED390 and BIOL390) where this objective is measured. The pre-requisite to these courses is senior standing in biology and students must have passed EDUC303 (Evaluation in Education). Students were assessed on their ability to write three types of assessment instruments: (see attached assignments and rubrics.) In each case, students who failed to get 80% or better had to meet with me to discuss problems with their assignment.</p> <p>1. Diagnostic assessment: Students wrote a probe for determining pre-conceived notions regarding a particular biology concept in the Washington Science Standards. They followed a national science standard prototype as illustrated in the NSTA Press publication, <u>Uncovering Student Ideas in Science</u> by Page Keeley (2009).</p> <p>2. Formative assessment: Students produced an inquiry-based activity that included formative assessment questions. Students created embedded questions that guided children through the construction of a particular concept identified in the Washington State Science Standards.</p> <p>3. Summative assessment: Students wrote WASL-like summative assessment questions that evaluate student understanding of a particular Washington State Science Standard. This included multiple choice as well as extended answers.</p>	<p>The mean score (N=15) for the three assignments were 89% (Probe); 84.4% (Inquiry Activity); 86.4% (WASL-like questions).</p> <p>A. Probe Assignment: All students met the objective with the probe in that they were able to write questions that could assess misconceptions as well as previous knowledge of a particular objective. Differences in achievement reflected the degree by which each question penetrated student understanding. This exercise reflected the pre-service teacher's understanding of the topic and writing abilities.</p> <p>B. Inquiry Activity Embedded Questions: This is the most difficult task of the three for students to achieve without a lot of experience in teaching. The variation in scores reflected differences in the pre-service teacher's classroom observations and teaching experiences. Scores also correlated with knowledge of subject in that students with the highest GPAs in the discipline also wrote the best questions for guiding the construction of a concept.</p> <p>C. WASL-like questions: Students had trouble following the guidelines for writing WASL-like questions described and illustrated by the Office of the Superintendent for Public Instruction (OSPI). They had some difficulty in writing questions that actually assessed the concept. Finally some students had difficulty determining the appropriate reading and content level of the questions. Students were allowed to rewrite of this assignment after meeting with instructor to help them better grasp the objective and achieve a reasonable assessment tool.</p>	<p>A. Probe assignment: Need to provide students with an example of an "A" paper from the year before even though they were given an excellent example from the book. This alerts them to the level of quality that is expected.</p> <p>B. Inquiry Activity Embedded Questions: This assignment is the last that students do in the quarter and unfortunately though they meet with me several times and write draft versions, some students write shallow questions that really do not direct thinking. Trying to teach students to do inquiry learning where guiding questions direct construction of concepts is a difficult task in a short period of time. It does not help that students are seeing few examples of inquiry learning in their own courses including the education courses. However, through discussions with Kevin Pyatt, Science Educator in the Dpt. of Education, we have plans to offer a dedicated section of EDUC309 (Strategies for Secondary Education) for science and math students. This course would become a pre-requisite or co-requisite for the SCED390 course. There students would have much more time to come to understand the process of inquiry teaching. Consequently we should see an improvement in their ability to direct student thinking through questioning.</p> <p>C. WASL-like questions: The opportunity to write for the WASL test last summer with OSPI greatly improves ability to direct students on what is and is not acceptable in the scenarios that emulate the format of the WASL. It is anticipated that students will still have to do rewrites but that is part of the learning process.</p>	<p>These actions are being implemented this Fall (2010).</p>	<p>Construction and use of effective assessment strategies remain an important SLO for the BAE in Biology</p>