

2015-2016 Annual Program Assessment Report

Please submit report to your department chair or program coordinator, the Associate Dean of your College, and to james.solomon@csun.edu, Director of the Office of Academic Assessment and Program Review, by September 30, 2016. You may, but are not required to, submit a separate report for each program, including graduate degree programs, which conducted assessment activities, or you may combine programs in a single report. Please identify your department/program in the file name for your report.

College: Science and Mathematics

Department: Biology

Program: B.A., B.S., and M.S.

Assessment liaison: Cheryl Hogue

1. Please check off whichever is applicable:

A. **Measured student work.**

B. **Analyzed results of measurement.**

C. **Applied results of analysis to program review/curriculum/review/revision.**

2. Overview of Annual Assessment Project(s). On a separate sheet, provide a brief overview of this year's assessment activities, including:

- an explanation for why your department chose the assessment activities (measurement, analysis, and/or application) that it enacted
- if your department implemented assessment **option A**, identify which program SLOs were assessed (please identify the SLOs in full), in which classes and/or contexts, what assessment instruments were used and the methodology employed, the resulting scores, and the relation between this year's measure of student work and that of past years: (include as an appendix any and all relevant materials that you wish to include)
- if your department implemented assessment **option B**, identify what conclusions were drawn from the analysis of measured results, what changes to the program were planned in response, and the relation between this year's analyses and past and future assessment activities
- if your department implemented **option C**, identify the program modifications that were adopted, and the relation between program modifications and past and future assessment activities
- in what way(s) your assessment activities may reflect the university's commitment to diversity in all its dimensions but especially with respect to underrepresented groups
- any other assessment-related information you wish to include, including SLO revision (especially to ensure continuing alignment between program course offerings and both program and university student learning outcomes), and/or the creation and modification of new assessment instruments

3. Preview of planned assessment activities for next year. Include a brief description and explanation of how next year's assessment will contribute to a continuous program of ongoing assessment.

2. Overview of Annual Assessment Project(s).

Undergraduate Biology Programs

Four Student Learning Outcomes (SLOs) were assessed in our undergraduate B.A. and B.S. programs in Biology:

SLO 1: Students can demonstrate knowledge of: a) the structure and metabolism of cells, b) the transmission and expression of genetic information, and C) the immediate and long term (evolutionary) consequences of interactions between organisms and their environment.

SLO 2: Students can demonstrate specialized knowledge in one or more disciplines of Biology.

SLO 3: Students are aware of and/or capable of using new and existing methods and technologies in these disciplines.

SLO 4: Students must demonstrate critical thinking in applying the methods of scientific inquiry, including observation, hypothesis testing, data collection and analysis.

The five core classes assessed were Biology 106, 107, 322, 360, and 380. Table 1 displays the specific SLOs assessed in each of these courses and the mean score on the assessment exams for academic years (AY) 2014-2015 and 2015-2016.

Table 1. Mean number of correct answers (%) on assessment questions for five core classes in the Biology Undergraduate Programs (B.A. and B.S.) is presented for academic years 2014-2015 and 2015-2016.

Course	SLOs Assessed	Mean Number Correct (%) 2014-2015	Mean Number Correct (%) 2015-2016
Biol 106	1	67	65
Biol 107	1	59	57
Biol 322	1, 2	57	61
Biol 360	1, 2, 3	76	75
Biol 380	1, 3, 4	72	75

The assessment tool we used for the core classes are multiple choice questions that reflect course content. These questions were developed by faculty in Core Curriculum Groups (CCG) established for each core class. Assessment questions are usually embedded in the final exam for a course but in some cases the questions were given as a separate exam that could be done on Moodle. Mean performance on assessment questions this past AY (2015-2016) were very similar to that for 2014-2015 AY (Table 1). We would like to see our students achieve an overall mean score of 60% on assessment questions. This has continued for BIOL 106, 360, and 380. BIOL 322 mean score now exceeds the 60% minimum. However, performance on BIOL 107 assessment questions continues to be below 60%, but this is still greater than the mean score for the 2013-2014 AY (53%). We also examined performance on individual assessment questions (Figures 1-5) by comparing the last two AY using t-tests with a 0.05 significance level.

In BIOL 106 (Figure 1) the percent correct responses were significantly increased for questions 1, 7, and 8. Note that performance on question 8 is now above 60%. Although performance on questions 3 and 6 were significantly decreased in 2015-2016 AY, performance is still above 60%. Question 5 remains below 60% for both AY. We suggest that the CCG for BIOL 106 revisit question 5 and discuss ways to improve student learning in these areas of the course. We also offer PLF (part of the Peer-Learning Facilitator Program) sessions for our core classes and this is a good forum where students can review key concepts presented in the class.

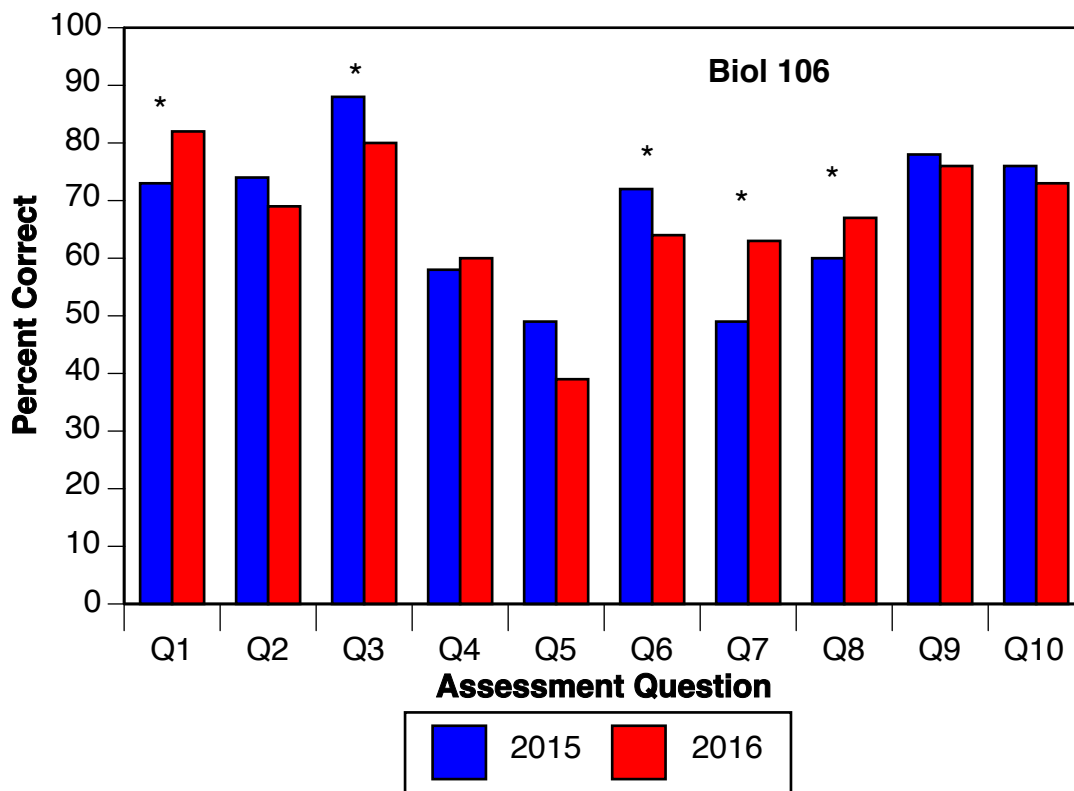


Figure 1. Comparison of SLO 1 in BIOL 106 for two academic years (AY): 2015 (2014-2015 AY, n=637) and 2016 (2015-2016, AY=446). The percentage of students that answered each assessment question correct is shown. An asterisk above specific question bars indicates significant differences between performance on that question for the two academic years.

There was a significant increase in performance on three of the assessment questions used in BIOL 107: 9, 11, and 18. However, performance on several assessment questions decreased significantly: 1, 2, 6, 7, 8, 15, 16, and 17. For the past two AY the overall mean percent correct on assessment questions for BIOL 107 has remained below 60% (Table 1). We suggest to faculty teaching this course to discuss ways to enhance coverage of the topics covered by these questions.

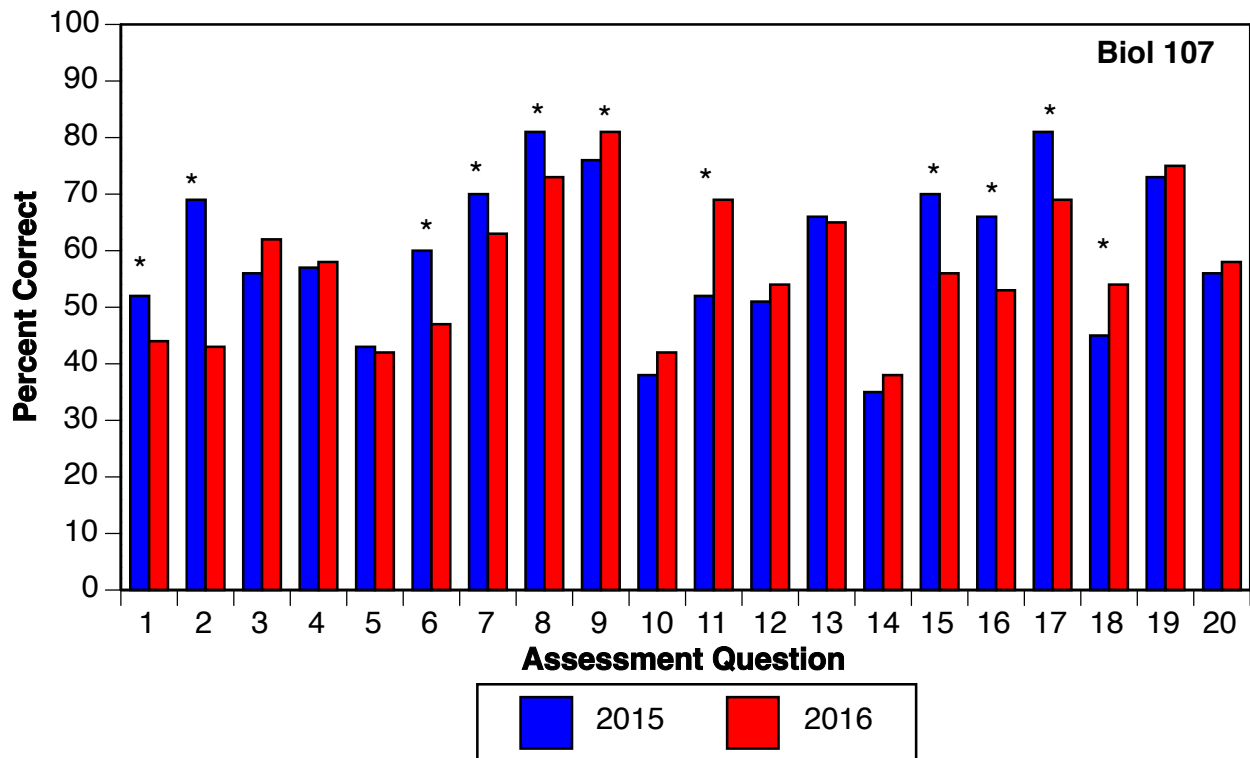


Figure 2. Assessment of SLO 1 in BIOL 107 for two academic years (AY): 2015 (2014-2015 AY, n=456) and 2016 (2015-2016 AY, n= 410). The percentage of students that answered each question correctly is shown. Asterisks above specific question bars indicate significant differences between performance on that question for the two academic years.

A significant increase in performance on assessment questions 2, 4, and 7 occurred for BIOL 322 (Figure 3). Performance on question 3 remained unchanged. The BIOL 322 CCG may want to address whether the concepts reflected by assessment question 3 need more coverage in the course.

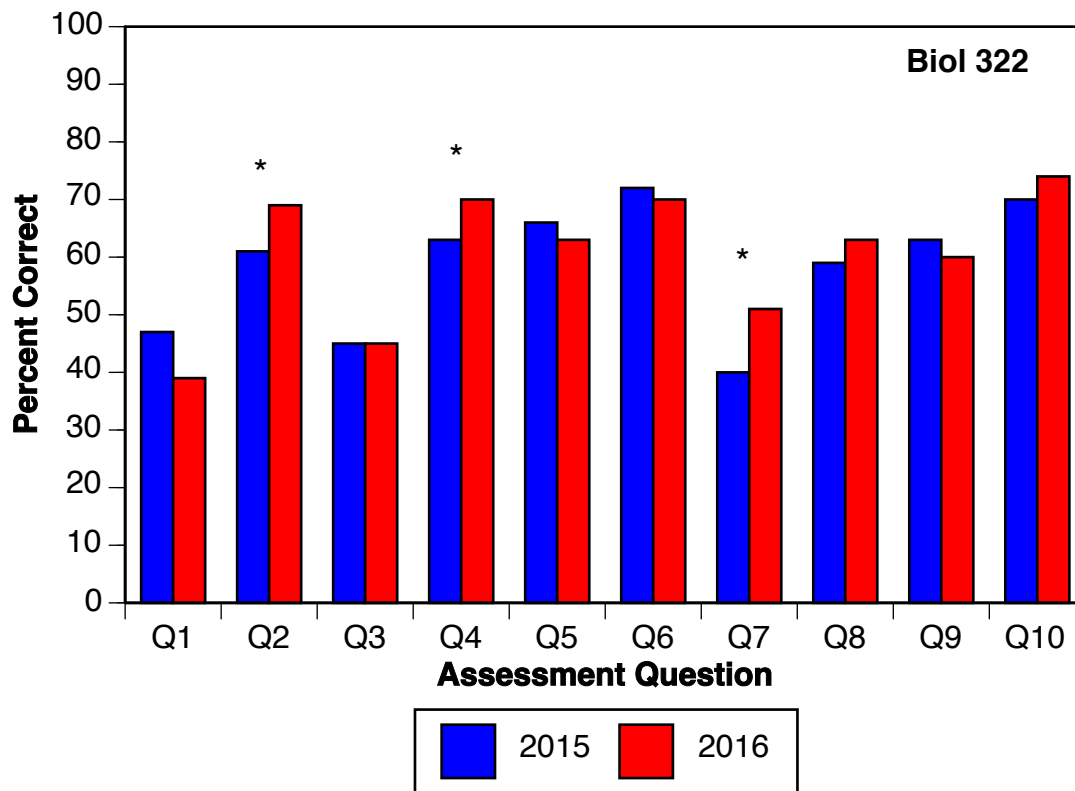


Figure 3. Assessment of SLOs 1 and 2 in BIOL 322 for two academic years (AY): 2015 (2014-2015 AY, n=391) and 2016 (2015-2016 AY, n=322). The percentage of students that answered each question correctly is shown. The asterisks above specific question bars indicate significant differences between performance on that question for the two academic years.

Both BIOL 360 and 380 had overall mean performance scores of 75% (see Table 1) for the 2015-2016 AY, well above our minimum requirement of 60%. A significant increase in performance on assessment questions 1, 4, 11, 13, and 19 were seen in BIOL 360 (Figure 4). Performance on questions 6, 10, 12, and 20 fell below our 60% performance goal. Performance on questions 6, 15, and 16 significantly increased for BIOL 380 (Figure 5).

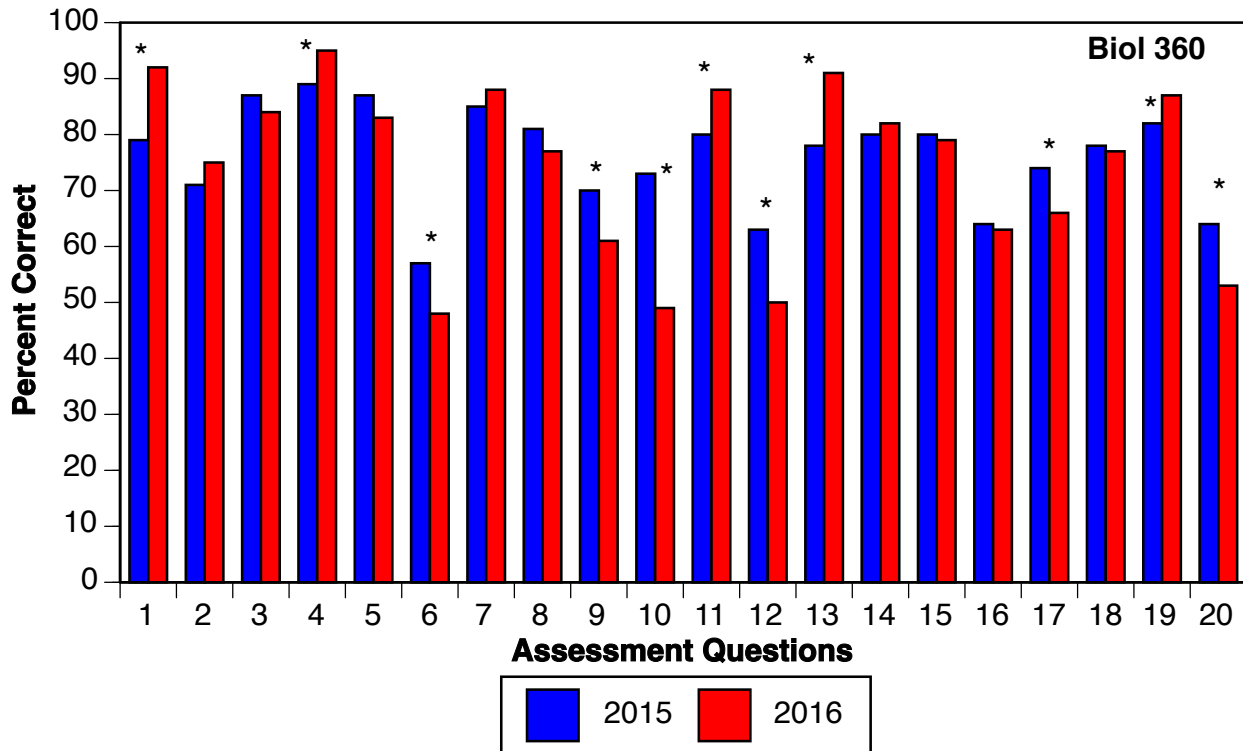


Figure 4. Assessment of SLOs 1, 2, and 3 in BIOL 360 for two academic years (AY): 2015 (2014-2015 AY, n=419) and 2016 (2015-2016 AY, n=391). The percentage of students that answered each question correctly is shown. The asterisks above specific question bars indicate significant differences between performance on that question for the two academic years.

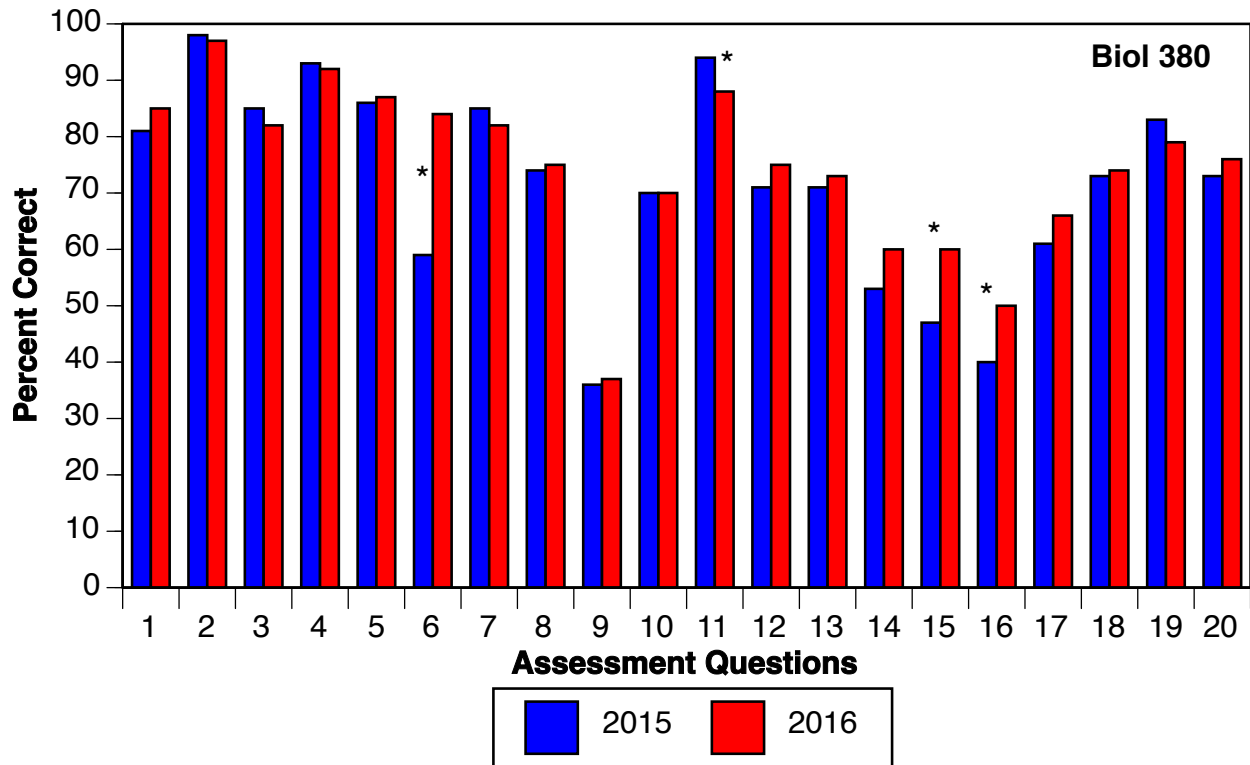


Figure 5. Assessment of SLOs 1, 3, and 4 in BIOL 380 for two academic years (AY): 2015 (2014-2015 AY, n=407) and 2016 (2015-2016 AY, n=252). The percentage of students that answered each question correctly is shown. The asterisks above specific question bars indicate significant differences between performance on that question for the two academic years.

In addition to measuring SLO 4 in BIOL 380, it was assessed in BIOL 511. Mean correct answers on assessment questions was 77%, n=19. SLO 5 (Ability to engage the biology literature and to communicate scientific information verbally and in writing) was evaluated in three courses, the core class BIOL 360 (n=71), and BIOL 421 (n=26) and 427 (n=18), and. For all three courses, mean performance score was a 4 on a scale of 1 to 5 with “1” being the lowest and “5” being the highest score. We will continue to encourage more assessment of SLOs 4 and 5 in our upper-division courses.

M.S. Graduate Program

We have four SLOs for the graduate program in Biology:

SLO 1: Students can demonstrate specialized knowledge in one or more disciplines of Biology.

SLO 2: Students are aware of and/or capable of using new and existing methods and technologies.

SLO 3: Students can demonstrate facility in applying the methods of scientific inquiry, including observation, hypothesis testing, data collection, and analysis.

SLO 4: Students can demonstrate professional level oral and written communication skills within a discipline of Biology.

Assessment of our graduate program in Biology focuses on the graduate student's thesis research project. (Figure 6). In our 2014-2015 assessment report we presented data on how students performed early in their graduate program, at the thesis proposal stage. We also present in this current report more data on the thesis proposal stage and data for the completed thesis (final thesis or thesis defense) and external review of the thesis (conducted by faculty not on the student's graduate committee). The rubric used to measure student performance at each stage of the master's thesis is included in the appendix. Different areas of the rubric are ranked on a scale of 1 to 5 with "1" being poor and "5" being excellent. Average rating for time for completion of the thesis proposal is still 3. In all other areas of the rubric for the thesis proposal, final thesis, and external review, the average rating was 4 or close to 4 showing that overall graduate students are doing very well in scientific merit of their research project, knowledge of the subject area, methodology, writing skills, presentation skills, as well as quality of their research.

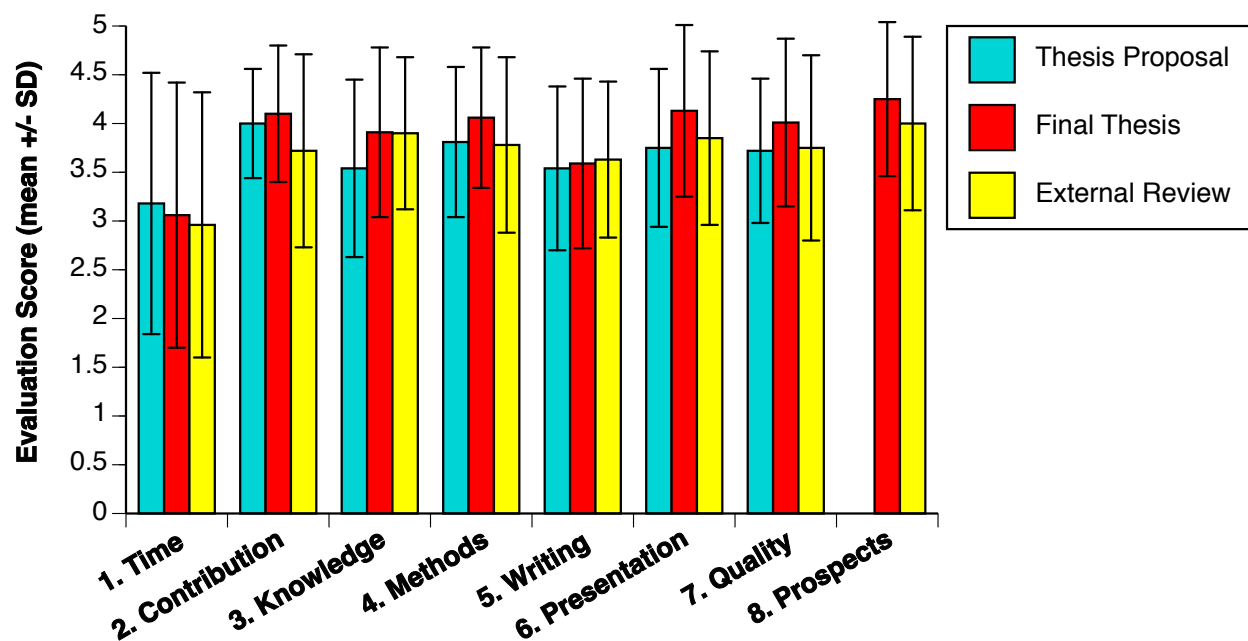


Figure 6. Assessment of the Biology Graduate Program SLOs 1, 2, 3, and 4. Graduate students were evaluated in several areas on a scale of 1 to 5 with “1” being the lowest rating and “5” being the highest. The thesis proposal and completed thesis were evaluated by the graduate committee. The final thesis was also evaluated by an external reviewer (typically a faculty member not on the student’s graduate committee). Sample sizes are n=85 for the Thesis Proposal, n=81 for the Final Thesis, and n=63 for External Review of the Thesis.

3. Preview of planned assessment activities for next year.

We will continue to assess most of our SLOs for the undergraduate programs in our core classes, BIOL 106, 107, 322, 360, and 380. Collection of longitudinal data continues and will be used to follow a given student’s performance as they transition from lower-division to upper-division courses. We will continue to encourage faculty to assess SLOs 4 and 5 in our upper-division courses and build our assessment data for these SLOs.

More data has been collected for our M.S. graduate program and we will continue to use the thesis research project as a major way to assess how our students are doing in the program.