

Program Name(s)	EETF Faculty Rep	Department Chair
M.S. Biological Sciences		Brian Perry

SUMMARY OF ASSESSMENT

A. Program Learning Outcomes (PLO)

Students graduating with a M.S. in Biological Sciences from Cal State East Bay will be able to:

1. Demonstrate a broad and sophisticated understanding that contributes to biological concepts and principles across all levels of biological organization, from ions to ecosystems (ILO 1,2,6);
2. Demonstrate expertise in a specific area of biological science (ILO 6);
3. Independently apply the scientific method to formulate testable biological hypotheses, analyze empirical data, and synthesize the results of the analysis (ILO 1,2,6);
4. Clearly communicate the design and results of an observational or experimental analysis in a variety of formats, including the graduate thesis, scientific paper, scientific poster, and oral presentation (ILO 1,2,6);
5. Gather and evaluate primary scientific literature and judge the value of the information presented in relation to particular biological questions (ILO 1,6).

B. Program Learning Outcome(s) Assessed

We assessed PLO2, 3, 4 and 5 (See above). This is the first time the department has assessed these program learning outcomes.

C. Summary of Assessment Process

Instrument(s): Maria Gallegos modified the “Inquiry and Analysis Value Rubric” and the “Communication Value Rubric” to assess the oral defense a capstone event in partial fulfillment of the Master of Science Degree. The original rubrics and those created to assess our Master of Science students at the oral defense are included in the Appendix. The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States. The Value Rubric Development Project was sponsored by the Association of American Colleges and Universities.

Sampling Procedure: The combined “Inquiry/Analysis and Communication Rubric” was applied to all 7 students that scheduled an oral defense in Spring of 2017.

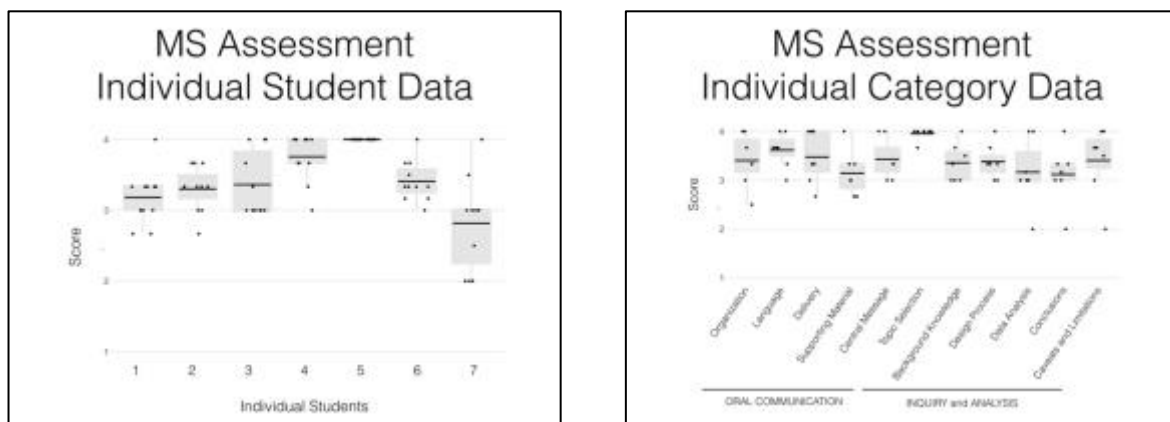
Sample Characteristics: The oral defense is one of the final requirements that our M.S. students complete. By the time a student schedules the oral defense, the University Thesis has been written and submitted for format review.

Data Collection: In all but one instance, all three committee members (including the thesis advisor) completed the combined “Inquiry/Analysis and Communication” Rubric just after the completion of the oral defense by the student. The thesis advisor collected the completed Rubrics and submitted these documents to the Graduate Coordinator. Upon receipt, the graduate coordinator forwarded a completion memo to the University Graduate Evaluator. Individuals that completed the “Inquiry/Analysis and Communication” Rubric this past year included Maria Gallegos, Claudia Stone, Chris Baysdorfer, Carol Lauzon, Brian Perry, Lisa Gorski, Maria Nieto and Danika Leduc.

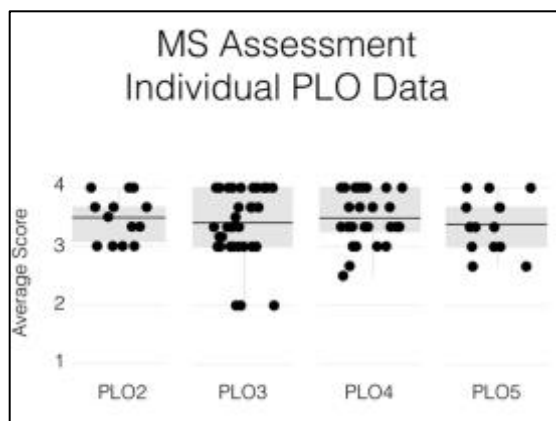
Data Analysis: The results shown in D (Summary of Assessment Results) include all individual data points (filled black circles). The black horizontal line represents the average. The gray boxes represent the first and third quartile and the vertical lines represent the minimum and maximum.

D. Summary of Assessment Results

Main Findings:



We hoped our students would score at 3 or above as 3=proficient (4=exemplary). On average, our students achieved a 3 or above when individual categories were examined (right graph). Moreover, we found that the majority of individual students performed at three or above in most categories (left graph). That said, there was one student that did not perform up to minimum standards (#7). We address this issue below (See **Recommendations for Program Improvement**). Below, the individual data points are sorted according to PLO (See Rubric in the Appendix). In general, our students performed above 3 on average. This graph is not as useful as the first two in determining where we need improvement.



Recommendations for Program Improvement: The faculty are aware of the areas in which our students require additional instruction and experience, and have decided upon steps that should be taken to improve student outcomes (see Next Steps below).

Next Step(s) for Closing the Loop: Our data suggests that our students may need a formative assessment prior to the oral defense so we can identify students that are struggling with specific program learning outcomes. In this way, we can attempt to address these issues before it becomes too late. The faculty have agreed in principle to add a departmental requirement. Namely, students will be required to meet with the committee members to not only demonstrate significant progress towards the completion the thesis research, but also to demonstrate adequate proficiency in the program learning outcomes. Students will need to submit a signed document that states the committee agrees that the student is ready to “Apply for Graduation” prior to doing so. We plan to meet again as a department in the coming weeks to discuss a more concrete timeline for this process. That said, as we transition to semesters, our curriculum will soon include a yearlong course (1 unit/semester) designed to explicitly teach our students how to perform an effective literature review, communicate science (oral and written), gather and evaluate data, and identify assumptions, caveats and limitations of research.

Other Reflections: In general, the faculty liked the rubric and thought it was an effective measure for assessing if our students are meeting our program learning outcomes. Again, we have decided to make it a requirement that all committee members (including the thesis advisor) complete the Oral Defense Rubric at the end of each oral defense. By using the same Rubric year after year, we hope to increase our statistical power and be able to evaluate if any of our programmatic changes make a difference in student outcomes.

E. Assessment Plans for Next Year

We will continue to assess PLO2, 3, 4 and 5 using the combined “Inquiry/Analysis and Communication” Rubric.