



The 2021-22 assessment for Learning Outcome #2 included survey results for five students who graduated between April 2021 and April 2022. Scores were averaged across respondents for each of the two questions for each student; the percentage of students meeting or exceeding the minimum criteria (3.0) are reported here.

## Results

For the assessment period, 80% of PhD students completing their dissertations in Biological Sciences obtained a mean score of at least 3.0 from their dissertation committee members on the “Mastery of Research Design” and “Mastery of Research Design and Execution” questions. The average score across the five students was 3.53 for “Mastery of Research Design” and 3.62 for “Mastery of Research Design and Execution”, and is again disproportionately affected by one student. The proportion of students (80%) meeting the minimum standard for both questions falls below our stated goal of 90%.

2021-22 Biological Sciences PhD Program Learning Outcome Assessment - Mastery of Research Design and Methods						
Student	1	2	3	4	5	Mean
Mastery of Research Design	2.67	4.00	4.00	3.67	3.33	3.53
Mastery of Research Design and Execution	2.67	3.75	4.00	4.00	3.67	3.62
Total number of students				5		
Students scoring > 3.0 on Q1				4		
Percent of students, Q1				80%		
Students scoring > 3.0 on Q2				4		
Percent of students, Q2				80%		

## Learning Outcome 3 – Mastery of Communication

### Methods

We assessed students’ mastery of research design and methods using a survey distributed to the dissertation committee within 10 days of the dissertation defense. Questions on the survey addressing this learning outcome included “Mastery of Communication” and “Mastery of Written Communication”, with students scored on a range of 1 (unsatisfactory) to 4 (outstanding). We also distributed an exit survey will be given to each student to report the number of national or regional conferences they attended, the number of posters or oral presentations given, and the number of publications they had submitted or accepted in peer-reviewed journals at the time of their defense.

The 2021-22 assessment for Learning Outcome #3 included survey results for nine students who graduated between April 2021 and April 2022. Scores were averaged across respondents for each of the two questions for each student; the percentage of students meeting or exceeding the minimum criteria (3.0) are reported here. The percent of students meeting the minimum criteria for meetings attended, presentations given, and publications submitted or accepted in peer-reviewed journals will be reported.

## Results

All but one of the PhD students (80%) completing their dissertations in Biological Sciences obtained a mean score of at least 3.0 from their dissertation committee members for all four of the communication questions, which fell below our stated goal for these questions. The average score across the eight students was 3.37 for “Mastery of Communication”, 3.18 for the goals portion of the “Mastery of Written Communication”, and 3.20 and 3.27 for the methods and results portions of the “Mastery of Written Communication” questions, respectively.

2021-22 Biological Sciences PhD Program Learning Outcome Assessment - Mastery of Communication						
Student	1	2	3	4	5	Mean
Mastery of Communication	2.33	3.50	3.00	4.00	4.00	3.37
Mastery of Written Communication: Goals	2.00	3.25	4.00	3.67	3.00	3.18
Mastery of Written Communication: Methods	1.67	3.67	3.00	4.00	3.67	3.20
Mastery of Written Communication: Results	2.00	3.67	4.00	3.33	3.33	3.27
Total number of students						5
Students scoring > 3.0 on Q1						4
Percent of students, Q1						80%
Students scoring > 3.0 on Q2.1						4
Percent of students, Q2.1						80%
Students scoring > 3.0 on Q2.2						4
Percent of students, Q2.2						80%
Students scoring > 3.0 on Q2.3						4
Percent of students, Q2.3						80%
2021-22 Biological Sciences PhD Program Learning Outcome Assessment - Mastery of Communication						
Student	1	2	3	4	5	Mean
# Meetings Attended	3	10	9	4	5	6.2
# Posters + Talks	3	10	9	4	4	6
# Publications Accepted + Submitted	5	4	3	2	0	2.8
Total number of students						5
Students with 2 meetings attended						5
Percent of students, meetings						100%
Students with 3 presentations						5
Percent of students, presentations						100%
Students with 2 papers						4
Percent of students, papers						80%

Students reported an average of 6 meetings attended during the course of their PhD program, and all of the 9 students met our minimum standard of two meetings attended. All students presented at least 3 times, which met our stated goal, and the average number of presentations given was 6. Only 80% of the students surveyed met our stated goal of 2

publications accepted or submitted at the time of the dissertation defense, although the average number of publications was 2.8.

## Learning Outcome 4 – Mastery of Work

### Methods

We assessed students’ mastery of their work using a survey distributed to the dissertation committee within 10 days of the dissertation defense. The question on the survey addressing this learning outcome included “Mastery of Work”, with students scored on a range of 1 (unsatisfactory) to 4 (outstanding).

The 2021-22 assessment for Learning Outcome #4 included survey results for five students who graduated between April 2021 and April 2022. Scores were averaged across respondents for each of the two questions for each student; the percentage of students meeting or exceeding the minimum criteria (3.0) are reported here.

### Results

Only 80% of PhD students completing their dissertations in Biological Sciences during the assessment period obtained a minimum mean score of 3.0 from their dissertation committee members on the “Mastery of Work” question; the average score across the five students was 3.45. The proportion of students (80%) meeting the minimum standard falls below our stated goal of 90%.

2021-22 Biological Sciences PhD Program Learning Outcome Assessment - Mastery of Work						
Student	1	2	3	4	5	Mean
Mastery of Work	2.00	3.25	4.00	4.00	4.00	3.45
	Total number of students			5		
	Students scoring > 3.0 on Q1			4		
	Percent of students, Q1			80%		

### 2022-23 Action Plan

As a consequence of the 2021-22 assessment results, three actions are planned for the 2022-23 academic year:

1. Continued and improved emphasis on student familiarity with the current literature and the major issues in their fields. Emphasis will take place in coursework where possible but also within individual laboratories.
2. Continued emphasis on communication of research by students, particularly written communication in the form of publications submitted and accepted. We initially feared that our stated goal of 2 publications accepted or submitted is too difficult for students at the time of their dissertation defense, our assessment this year suggests otherwise.

3. Continued and improved emphasis students' mastery of their work, including research and study design, as evidenced by their ability to openly reason and answer probing questions of their research.

### **Timeline for Action Plan**

A timeline for the implementation of the action plan for the 2022-23 academic year follows:

1. Student familiarity with the current literature and the major issues in their fields will continue to be emphasized in courses and individual laboratories. The department will emphasize the importance of these issues to all PIs, with significant improvements expected within 3 years.
2. The department will continue to emphasize the importance of student publications.
3. Student mastery of their work will continue to be emphasized in courses and individual laboratories. The department will emphasize the importance of PhD students' abilities to reason and answer questions about their research, with significant improvements expected within 3 years.