

MS Biological Sciences 2021-22 Learning Outcome Assessment Report

Learning Outcome 1 – Mastery of Field

Methods

We assessed students' mastery of their field 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 Field" and "Mastery of Current Literature in Field", with students scored on a range of 1 (unsatisfactory) to 4 (outstanding).

The 2021-22 assessment for Learning Outcome #1 included survey results for four students who graduated between May 2020 and May 2022. We combined two years' worth of data to obtain an adequate sample size of students. 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

Acknowledging a small sample size, only 50% of MS students completing their theses in Biological Sciences between 2020 and 2022 obtained a minimum mean score of 3.0 from their thesis committee members on the "Mastery of Field" and "Mastery of Current Literature in the Field" questions. The average score across the four students was 2.58 for "Mastery of Field" and 2.29 for "Mastery of Current Literature". The proportion of students (50%) meeting the minimum standard for both questions fall below our stated goal of 80%.

2020-22 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Field					
Student	1	2	3*	4*	Mean
Mastery of Field	3.00	2.33	2.00	3.00	2.58
Mastery of Current Literature	3.00	1.67	1.50	3.00	2.29
	Total number of students			4	
	Students scoring > 3.0 on Q1			2	
	Percent of students, Q1			50%	
	Students scoring > 3.0 on Q2			2	
	Percent of students, Q2			50%	

Learning Outcome 2 – Mastery of Research Design and Methods

Methods

We assessed students' mastery of research design and methods using a survey distributed to the thesis committee within 10 days of the thesis defense. Questions on the survey addressing this learning outcome included "Mastery of Research Design" and "Mastery of Research Design and Execution", with students scored on a range of 1 (unsatisfactory) to 4 (outstanding).

The 2021-22 assessment for Learning Outcome #2 included survey results for five students who graduated between May 2020 and May 2022. We combined two years' worth of data to obtain an adequate sample size of students. 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

Between 2020 and 2022, 75% of MS students completing their theses in Biological Sciences obtained a mean score of at least 3.0 from their thesis committee members on the "Mastery of Research Design" question, and 50% on the "Mastery of Research Design and Execution" question. The average score across the five students was 3.25 for "Mastery of Research Design" and 2.83 for "Mastery of Research Design and Execution". These proportions both fall short of our stated goal of 80% for both the "Mastery of Research Design" and the "Mastery of Research Design and Execution" questions.

2020-22 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Research Design and Methods					
Student	1	2	3*	4*	Mean
Mastery of Research Design	3.50	3.00	2.50	4.00	3.25
Mastery of Research Design and Execution	3.00	2.33	2.00	4.00	2.83
Total number of students				4	
Students scoring > 3.0 on Q1				3	
Percent of students, Q1				75%	
Students scoring > 3.0 on Q2				2	
Percent of students, Q2				50%	

Learning Outcome 3 – Mastery of Communication

Methods

We assessed students' mastery of research design and methods using a survey distributed to the thesis committee within 10 days of the thesis 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 five students who graduated between May 2020 and May 2022. We combined two years' worth of data to obtain an adequate sample size of students. 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

During the assessment period, 75% of MS students completing their theses in Biological Sciences obtained a mean score of at least 3.0 from their thesis committee members on the “Mastery of Communication” question, and 50% on all of the “Mastery of Written Communication” questions. All of these proportions fell short of our stated goal of 80%. The average score across the five students was 3.25 for “Mastery of Communication”, 2.96 for the goals portion of the “Mastery of Written Communication”, and 3.04 and 2.83 for the methodology and results portions of the “Mastery of Written Communication” questions, respectively.

2020-22 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Communication					
Student	1	2	3*	4*	Mean
Mastery of Communication	3.50	3.00	2.50	4.00	3.25
Mastery of Written Communication: Goals	3.50	2.33	2.00	4.00	2.96
Mastery of Written Communication: Methods	3.00	2.67	2.50	4.00	3.04
Mastery of Written Communication: Results	3.00	2.33	2.00	4.00	2.83
Total number of students					4
Students scoring > 3.0 on Q1					3
Percent of students, Q1					75%
Students scoring > 3.0 on Q2.1					2
Percent of students, Q2.1					50%
Students scoring > 3.0 on Q2.2					2
Percent of students, Q2.2					50%
Students scoring > 3.0 on Q2.3					2
Percent of students, Q2.3					50%

MS students reported an average of 1 meeting attended during the course of their MS program, but only 50% of the 4 students met our minimum standard of one meeting attended. Two of the four students gave at least one presentation, which met our stated goal. Unfortunately, only one student (out of four) surveyed met our stated goal of one publication accepted or submitted at the time of the thesis defense. The average number of publications was 0.25.

2020-22 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Communication					
Student	1	2	3*	4*	Mean
# Meetings Attended	0	2	0	2	1.00
# Posters + Talks	0	2	0	2	1.00
# Publications Accepted + Submitted	0	1	0	0	0.25
Total number of students					4
Students with a meeting attended					2
Percent of students, meetings					50%
Students with a presentation					2
Percent of students, presentations					50%
Students with a paper					1
Percent of students, papers					25%

that MS students may have a harder time having papers accepted or submitted prior to their thesis defense compared to PhD students.

4. Based on last year's assessment, continued and improved emphasis students' mastery of their work, 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 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 having MS students in their labs, with significant improvements expected within 3 years.
2. The department will continue to emphasize the importance of student publications for MS students, beginning in Fall 2022.
3. Student mastery of their work will continue to be emphasized in courses and individual laboratories. The department will emphasize the importance of MS students' abilities to reason and answer questions about their research, with significant improvements expected within 3 years.