MS Biological Sciences 2019-20 Learning Outcome Assessment Report

Learning Outcome 1 – Mastery of Field

Methods

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

The 2019-20 assessment for Learning Outcome #1 included survey results for three students who graduated between May 2019 and April 2020. Scores were averaged across respondents for each of the two questions for each student; the percentage of students exceeding the minimum criteria (3.0) are reported here.

Results

Acknowledging a very small sample size, 67% of MS students completing their theses in Biological Sciences in 2019 and 2020 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 three students was 3.56 for both "Mastery of Field" and "Mastery of Current Literature". However, the proportion of students (67%) meeting the minimum standard for both questions falls below our stated goal of 80%.

2019-20 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Field

Student	1	2	3	Mean
Mastery of Field	3.67	4.00	3.00	3.56
Mastery of Current Literature	3.67	4.00	3.00	3.56

Total number of students	3
Students scoring > 3.0 on Q1	2
Percent of students, Q1	**67%**
Students scoring > 3.0 on Q2	2
Percent of students, Q2	**67%**

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 2019-20 assessment for Learning Outcome #2 included survey results for three students who graduated between May 2019 and April 2020. Scores were averaged across respondents for each of the two questions for each student; the percentage of students exceeding the minimum criteria (3.0) are reported here.

Results

In 2019 and 2020, 100% 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" the "Mastery of Research Design and Execution" questions. The average score across the three students was 3.18 for "Mastery of Research Design" and 3.89 for "Mastery of Research Design and Execution". The proportion of students (100%) meeting the minimum standard exceeds our stated goal of 80% for both the "Mastery of Research Design" and the "Mastery of Research Design and Execution" questions.

2019-20 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Research Design and Methods

Student	1	2	3	Mean
Mastery of Research Design	3.67	3.67	4.00	3.78
Mastery of Research Design and Execution	4.00	3.67	4.00	3.89

Total number of students	3
Students scoring > 3.0 on Q1	3
Percent of students, Q1	**100%**
Students scoring > 3.0 on Q2	3
Percent of students, Q2	**100%**

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 2019-20 assessment for Learning Outcome #3 included survey results for three students who graduated between May 2019 and April 2020. Scores were averaged across respondents for each of the two questions for each student; the percentage of students 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 (100%) 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 all of the “Mastery of Written Communication” questions. The average score across the three students was 3.89 for “Mastery of Communication”, which exceeded our stated goal of 80%. The average score was 3.78 for the goals portion of the “Mastery of Written Communication”, and 3.78 and 3.67 for the methodology and results portions of the “Mastery of Written Communication” questions, respectively. These proportions (100%) exceed our stated goal of 80% for these questions.

2019-20 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Communication

Student	1	2	3	Mean
Mastery of Communication	4.00	4.00	3.67	3.89
Mastery of Written Communication: Goals	3.67	4.00	3.67	3.78
Mastery of Written Communication: Methods	4.00	4.00	3.33	3.78
Mastery of Written Communication: Results	3.67	4.00	3.33	3.67

Total number of students	3
Students scoring > 3.0 on Q1	3
Percent of students, Q1	**100%**
Students scoring > 3.0 on Q2.1	3
Precent of students, Q2.1	**100%**
Students scoring > 3.0 on Q2.2	3
Percent of students, Q2.2	**100%**
Students scoring > 3.0 on Q2.3	3
Percent of students, Q2.3	**100%**

MS students reported an average of 1 meeting attended during the course of their MS program, and all of the 3 students (100%) met our minimum standard of one meeting attended. Two of the three students (67%) gave at least one presentation, which fell short of our stated goal of 80%. Only 67% of the students surveyed met our stated goal of one publication accepted or submitted at the time of the thesis defense, although the average number of publications was 1.67.

2019-20 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Communication

Student	1	2	3	Mean
# Meetings Attended	3	3	1	2.33
# Posters + Talks	3	3	1	2.33
# Publications Accepted + Submitted	0	1	1	0.67

Total number of students	3
Students with a meeting attended	3
Percent of students, meetings	**100%**
Students with a presentation	3
Precent of students, presentations	**100%**
Students with a paper	2
Percent of students, papers	**67%**

Learning Outcome 4 – Mastery of Work

Methods

We assessed students' mastery of their work using a survey distributed to the thesis committee within 10 days of the thesis 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 2019-20 assessment for Learning Outcome #4 included survey results for three students who graduated between May 2019 and April 2020. Scores were averaged across respondents for each of the two questions for each student; the percentage of students exceeding the minimum criteria (3.0) are reported here.

Results

All three (100%) of the MS students completing their theses in Biological Sciences in 2019 and 2020 obtained a minimum mean score of 3.0 or higher from their thesis committee members on the "Mastery of Work" question; the average score across the three students was 3.89. This proportion of students meeting the minimum standard falls below our stated goal of 80%.

2019-20 Biological Sciences MS Program Learning Outcome Assessment - Mastery of Work

Student	1	2	3	Mean
Mastery of Work	4.00	4.00	3.67	3.89

Total number of students	3
Students scoring > 3.0 on Q1	3
Percent of students, Q1	**100%**

2020-21 Action Plan

As a consequence of the 2019-20 assessment results, three actions are planned for the 2020-21 academic year:

1. Continued and improved emphasis on student familiarity with the current literature and particularly 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 acknowledge that MS students may have a harder time having papers accepted or submitted prior to their thesis defense compared to PhD students.
3. 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 2020-21 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 emphasize the importance of student publications, beginning in Fall 2020 (with the condition of potentially working remotely in the environment of COVID-19, and the issues that situation presents).
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.