BA Biological Sciences 2019-20 Learning Outcome Assessment Report

Learning Outcome 1 – Adequate Progress

Methods

We assessed students' adequate progress using data gathered from the Office of Institutional Research that describes the number of semesters students required to progress from (a) first-time enrollment in Bio 2600 (Cell Biology) to first-time enrollment in Bio 3070 (Genetics); (b) first-time enrollment in Bio 3070 to first-time enrollment in Bio 4200 (Evolution); and (c) first time enrollment in Bio 4200 to graduation.

Data were gathered in May 2020, including students graduating in the Spring/Summer, Fall, and Winter terms of 2019 or 2020. Degrees earned in Winter 2020 were not yet finalized at the time of this report and therefore were not included in this analysis. The number of semesters needed to progress among the three courses and graduation for each student during the assessment period were tabulated, and the percent of students meeting the minimum criteria for each transition is reported.

Results

A total of 79 students completed their BA in Biological Sciences between Fall 2018 and Winter 2020. Overall, 33% of students pursuing their BA degree completed their program in 10 semesters or fewer, which fell well below our stated goal of 75% and was a decrease from last year's assessment (38%). Students averaged 15.6 semesters to finish their BA degree. Of the 79 students, 86.1% progressed from BIO 2600 to BIO 3070 in 4 semesters or fewer; this value exceeds our goal of 60% and is an improvement over last year (83%). The mean time to progress between these two courses was 2.3 semesters. In addition, 79.5% of these students progressed from BIO 3070 to BIO 4200 in 3 semesters of less, which exceeds our goal of 75% and is a slight improvement over last year (79%). The mean time to progress between these courses was 3.2 semesters. Finally, 58.4% of students progressed from BIO 4200 to graduation in 2 semesters or fewer, which fell below our stated goal of 90% and was a decrease from last year (68%). The mean time to progress between these courses was 3.4 semesters.

Learning Outcome 2 – Understanding of Evolution

Methods

We assessed students' understanding of the core concept of evolution using the final grades assigned in the capstone course in Biological Sciences, BIO 4200 (Evolution). All final grades from the course taught in Spring/Summer 2019, Fall 2019, and Winter 2020 were utilized for this assessment. Letter grades were pooled across all semesters, and the percentage of students exceeding the minimum criteria to demonstrate an understanding of the concept (B-letter grade) are reported here.

Results

During the assessment period, 35 BA students successfully completed BIO 4200, and 83% of those students (29 students) completed the course with a B- letter grade or higher. Notably, only one student earned a grade of D+ or worse (3%), which is considered failing in the Department of Biological Sciences. These values represent an improvement over the 2018-19 assessment data (73% with a B- letter grade or higher and 4% failing), and meet our stated goal of 75% of students earning a grade of B- or higher. As before, we note that most students that enter BIO 4200 are within a year of graduation, such that success in the course is typically higher than expected. As such, Learning Objective 2 should be assessed using intermediate of formative courses as well as the advanced course in the subject. Formative courses in evolution (2000-level) are currently being developed in the Department as it completes its undergraduate curriculum revision, which should make assessment at this level possible in the near future.

Learning Outcome 3 – Mastery of Written Communication

Methods

We assessed students' mastery of written communication in biological sciences using a term paper assignment common to the three 4000-level writing intensive courses within the department (BIO 4110: Biomedical Technology and Molecular Biology, BIO 4120: Comparative Physiology, and BIO 4130: General Ecology). Each course requires multiple writing assignments that require revision, and the final term paper assignment is graded using a rubric common to all three courses. We used the distributions of the points earned for the final term paper based on the rubric to assess students' mastery of written communication in the biological sciences. The proportion of students meeting or exceeding the minimum criterion of 80% of the rubric points (58 of 70 points) is reported here, with our stated goal being 80%.

Results

In the 2019-20 academic year, 39 students working towards a BA in Biological Sciences completed one of the writing intensive courses, and 90% of these students scored at least 80% of the points on the rubric for the final draft of their term paper in the writing intensive courses. This proportion well exceeds our stated goal of 80%. Notably, 59% of the students scored at least 90% of the rubric points (a decrease from 77% last year), but 31% scored 100% of the points (a large increase from 8% last year). Four of the 39 students (10%) scored fewer than 80% of the rubric points on the term paper assignment.

2020-21 Action Plan

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

1. Focus on reducing the time to graduation for our majors in the BS program, with emphasis on improving the successful progress between BIO 4200 and graduation.

2. Continued emphasis on improving students understanding of the core concept of evolution. We acknowledge that our method of assessment in this regard needs to be improved, with specific exam questions or quizzes in multiple courses utilized to assess understanding of evolution rather than a single final grade in a capstone course.
3. Continued and improved emphasis on written communication. Though our efforts appear to be successful thus far, assessment needs occur in courses other than the writing-intensive courses alone. Again, curriculum revision should make this possible in future years given the trend toward writing in courses beyond these three.

Timeline for Action Plan

A timeline for the implementation of the action plan for the 2020-21 academic year follows:

1. Changes to the BIO 2600 course will be implemented beginning in Fall 2020 that will improve student performance and progress from BIO 2600 to BIO 3070.
2. Formative courses in evolution will be offered at the 2000 level beginning in Fall 2020 that will allow assessment of the understanding of evolution near the outset of students' degree programs as well as their conclusion.
3. Continued and improved emphasis on written communication will be assessed using writing assignments in multiple courses (at formative and advanced levels) rather than the writing-intensive courses alone. This will be accomplished as curriculum revision provides writing instruction across multiple courses in the department.