

Institutional Effectiveness Report

General Education

Department of Biology
Academic Year 2020-2021

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Executive Summary of Report

The Biology Department assessed student achievement this year in one general education course offered by the department (Biology 104) with cumulative exams. We were unable to administer the cumulative exam to the other general education course offered by the department (Biology 103) in the fall semester because the campus was still adhering to COVID-19 protocol and restrictions. This academic year we again used “pre-post testing” to assess achievement from the beginning to the end of the semester. We administered different but comparable forms of each exam that we created to ensure that the student is not taking the same exam twice. Achievement did not meet benchmarks nor targets. However, achievement improved 9% from the beginning of the semester to the end of the semester. We will continue discussions of issues related to achievement. To improve student performance we will enhance instruction in areas we determine from the exam results that need to be reinforced.

General Education - Science-Related Goal:

Goal 5: The ability to describe the natural world and apply scientific principles to critically analyze experimental evidence and reach conclusions

Student Learning Outcomes derived from that goal:

1. The student will have the ability to describe the natural world.
2. The student will the ability to critically analyze experimental evidence and reach conclusions.

Assessment Methods

1. The student will have the ability to describe the natural world at the overall average of: Baseline (3-year average of Bio 103 and Bio 104) 66%, Benchmark 66%, Target (4 year, set in 2021) 68%, as measured by a cumulative exam.
2. The student will the ability to critically analyze experimental evidence and reach conclusions at the overall average of: Baseline (3-year average of Bio 103 and Bio 104) 60%, Benchmark 60%, Target (4 year, set in 2019) 64%, as measured by a cumulative exam.

The Department of Biology offers two courses that non-majors may take to complete science-related general education requirements at FMU (Biology 103 and 104). However, we were only able to assess Biology 104 in the spring semester 2021. We were unable to assess Biology 103 in the fall 2020 because the campus was still adhering to COVID-19 protocols and we were unable to administer the exams.

To assess student success in meeting the science-related learning outcomes 1 and 2 above, a course-specific cumulative exam (multiple choice format) was administered. We implemented the use of “pre-post testing” to assess achievement from the beginning to the end of the semester in each course. We created different but comparable forms of each exam to ensure

that the student is not taking the same exam twice. We administered the exam to Biology 104 students at the beginning and at the end of the spring semester 2021. We regard the mean percent score of the exam results for all students to be a reasonable indicator of student-success in meeting the science-related general education learning outcomes.

Assessment Results

Student Learning Outcomes

1. The students demonstrated the ability to describe of the natural world at an average of 61% as measured by a cumulative exam. Since that is less than the benchmark of 66% and the target of 68%, neither of those goals was achieved.
2. The students demonstrated the ability to critically analyze experimental evidence and reach conclusions at an average of 53% as measured by a cumulative exam. Since that is less than the benchmark of 60% and the target of 64%, neither of those goals was achieved.

Tables 1 below lists the exam questions that apply to each learning outcome and summarizes the results. We administered exams at the beginning and the end of the semester.

Table 1. Summary of results of the Biology 104 cumulative exam administered in Spring 2021 at the beginning and at the end of the semester. Results from the end of the Spring 2019 semester are included for comparison.

Student Learning Outcome	Assessment (question that pertains to each learning outcome)	Result (Mean percent correct)		
		Spring 2019 End	Spring 2021 Beginning	Spring 2021 End
1. The student will have the ability to describe understanding of the natural world.	1, 2, 4,6-8, 10, 11,15, 17, 19,21-23	69	47.2	61.3
2. The student will have the ability to critically analyze experimental evidence and reach conclusions.	3, 5, 9, 12 -14, 16, 18, 20, 24, 25	57.3	51.3	53
Number of students		47	77	68
Overall mean		63.8%	49%	58%

Student achievement did not meet the benchmarks nor the targets of either SLO 1 (understanding the natural world) nor SLO 2 (critically analyze experimental evidence and reach conclusions) (Benchmarks: SLO 1 66%, SLO 2 60%; Targets: SLO 1 68%, SLO 2 64%) in both the overall exam average and on questions that assessed each SLO separately. In addition, overall achievement decreased about 6% compared to two years ago when this course was last examined. However, by the end of the semester achievement increased in each separate SLO and the overall average increased 9%.

The campus was still adhering to COVID-19 protocols in the spring 2021 that required adjustments to lecture delivery and changes to the laboratory exercises performed this semester. Lectures were not all face-to-face and some laboratory exercises were changed to virtual as well. These adjustments to the course delivery may have had a negative impact on and be responsible for the decline in student achievement this year.

Action items

An action plan that addresses the following areas is being developed for implementation during the next academic year:

Student Learning Outcomes

1. The student will have the ability to describe the natural world.
 2. The student will the ability to critically analyze experimental evidence and reach conclusions.
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1. We will continue to administer the cumulative exams in both semesters (Bio 103 Fall, Bio 104 Spring) and to as many sections of the courses as possible.
 2. To improve student achievement, faculty reinforced certain core principles and concepts and critical thinking skills. Benchmarks and targets were not achieved in Bio 104. However, we were unable to assess Bio 103 this year thus we will ensure that instruction will continue to be enhanced in all areas in both courses in 2021-2020.
 3. We will continue our practice of administering pre- and post- exams at the beginning and end of the courses in the 2021-2022 academic year. Creation of different but comparable forms of each exam for both courses (Bio 103 and 104) was completed but evaluation of the results for reliability and refinement of the exams is not complete and will be carried over to the 2021-2022 academic year.
 4. We evaluated the exams for balance between content vs critical thinking. However, the evaluation of exams based on individual exam item analysis results from test item statistics will be carried over to 2021-2022 to determine if more question refinement is warranted. That continued evaluation and revision of the exams to better assess the students will be carried over to the 2021-2022 academic year.