CPI _ Improving Program Learning Outcomes Report

CPI Improving PLO Report (AY22-23)
Name of the program__ Biology/Biotechnology/Chemistry_____
Dean' signiture_____
Expected Date of Submission 6/30/2023
Department Chair or Director: _Michael Hadjiargyrou_____

NYIT's CPI process is implemented to meet *MSCHE Standard V: Educational Effectiveness Assessment: Assessment of student learning and achievement demonstrates that the institution's students have accomplished educational goals consistent with their program of study, degree level, the institution's mission, and appropriate expectations for institutions of higher education.*
All degree program's PLO assessment plan (2022-2025) are posted through the link:

http://www.nyit.edu/planning/academic_assessment_plans_reports.

This is a report of its implementation for year 2022-2023. The report should address the following points:

I. The Annual Program Learning Outcomes (PLOs) Assessment should include the followings.

1. PLO (Program Learning Outcomes) assessed. list the PLOs that have been assessed in AY 22-23 based on your three-year plan(AY22_25)

   - **PLO#1** Design and/or conduct investigations to test hypotheses by applying the scientific method
   - **PLO#2** Critically review and communicate scientific data in a quantitative and qualitative manner via oral and written formats

2. METHOD: Describe the method of assessment and attach measurement instruments (e.g., rubric, exam items, scoring guide for a particular task, supervisor evaluation form, survey instrument, and other assessment tools).

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PLO 1: *Assessed through the rubric included below. BIOL/CHEM 48X was assessed directly through a written report.*

PLO 2: *Assessed through the rubric and survey included below. Oral presentations in BIOL/CHEM 395 were assessed directly by the instructor using the rubric (graded feedback) and indirectly through class surveys (ungraded feedback).*

3. ANALYSIS of the assessment results: provide criteria based disaggregate and aggregate data analysis.

PLO 1:

Direct assessment. *Each student submitted a draft grant proposal. This proposal was lightly edited to highlight problems, including missing sections and glaring errors of fact. The final products were graded (mean 93.5, range 91-96). The sections labeled "Specific Aims" and "Analysis plan" are directly tied to PLO 1 and demonstrate students have a good to excellent ability to address hypotheses and while applying the scientific method.*

Informally, it was observed that students often simply neglect to follow instructions, and leave out sections. Pointing out missing parts lead students to include these sections. The weakest part for students was explaining how data from proposed experiments would be analyzed and interpreted to generate or update a model for drug mechanism.

Criteria	Mean Score (Range)
Grammar, spelling	9.5/10 (9-10)
Format	30/30 (30)
Background/Rationale	18.3/20 (16-20)
Clear Specific Aims	9/10 (8-10)
Clear logic	9.2/10 (8-10)
Clear explaination	8.8/10 (8-10)
Analysis plan	8.7/10 (8-9)

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PLO 2:

Direct assessment. *Each student presented twice during the course with the average grade on Presentation 2 (mean: 95.6 range: 82-100) being higher than Presentation 1 (mean: 90.3, range: 82-97). 94% of students showed improvement on the second presentation. The average improvement for an individual student on the second presentation was +5.4 points. On average students showed the greatest mastery in the organization of their oral presentations and ability to address questions from the audience with both scores in the excellent range according to the rubric. Students showed the greatest weakness in their use of visual aids which increased from "good" to "excellent" by the second presentation. See table below.*

Criteria	*Presentation 1* *Mean Score (Range)*	*Presentation 2* *Mean Score (Range)*
Organization	*9.3/10 (8-10)*	*9.8/10 (9-10)*
Understanding	*36.4/40 (34-39)*	*37.9/40 (27-40)*
Style/Delivery	*21.3/25 (17-24)*	*23.6/25 (20-25)*
Use of Visual Aids	*8.3/10 (5-10)*	*9.3/10 (7-10)*
Ability to Answer Questions	*15/15 (15)*	*15/15 (15)*
Total Score	*90.3 (82-97)*	*95.6 (82-100)*

Indirect assessment. *After each presentation audience feedback was gathered using a Google form. This data was anonymized and summary provided to each student to help them identify their strengths and weaknesses. According to the survey, the audience, composed of their fellow students, felt presenters were effective (mean: 4.8/5, range 4.3-5) and had good use visual aids (4.8/5, range 4.2-5). The biggest area found in need of improvement was the presenter's ability to interpret data (4.7/5, range, 4.3-4.9). Each of these metrics was found to improve in the second round of presentations (see table below). Of the open-ended questions, instructors found that most comments consisted of advice on how to improve and recognition of improvement. For example, a student who received the comments "Take deep breaths and collect your thoughts" and "Speak a*

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bit slower and maybe a lighter background for the slides" as recommendations on how to improve after their first presentation then received comments like "XXX improved exponentially compared to his first presentation it was basically like night and day, great job." and "Improved heavily from last time".

Criteria	Presentation 1 Mean Score (Range)	Presentation 2 Mean Score (Range)
Effectiveness	4.8/5 (4.31-5)	4.89/5 (4.60-5)
Organization	4.70/5 (4.38-4.93)	4.90 (4.71-5)
Data Interpretation	4.66/5 (4.15-4.93)	4.89/5 (4.40-5)
Timing	4.72/5 (4.40-5)	4.91/5 (4.64-5)
Engagement	4.68/5 (4.33-4.93)	4.86/5 (4.27-5)
Understandability	4.74/5 (4.38-4.93)	4.87/5 (4.53-5)
Use of Visual Materials	4.76/5 (4.23-5)	4.88/5 (4.47-5)

4. INTERPRETATION: to what degree did students achieve the program learning outcomes based on your data analysis and expected learning outcomes?

PLO 1: BIOL/CHEM 48X is an upper level Experiential Education capstone course typically taken by seniors. It provides students an opportunity to pursue a semester-long structured project under the direction of a faculty member. The written grant proposal assessment requires students to integrate their own experimental results with material learned in earlier courses and with primary research. The direct assessment demonstrates that students are able to critically review and communicate scientific data and ideas in a written manner. The informal indirect assessment of drafts helps ensure student fulfill requirements.

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PLO 2: *BIOL/CHEM 395 is an upper level course and provides students an opportunity to explore primary literature in a speech intensive (SI) course. The direct and indirect assessment both demonstrate that students are able to critically review and communicate scientific data through an oral presentation.*

5. CLOSE THE LOOP – If the expected program learning outcomes were successfully met, describe how the program will keep or expand the good practices, if not, refine or create the next cycle of PDSA

   The expected program learning outcomes were successfully met as described above. To continue good practices these assessments are being discussed among the faculty of the department and refined to create better assessments of student achievement.

II. Brief Description of Faculty Engagement in the Current Annual Assessment Report:

The plan and its results will be conveyed to the department through periodic updates and discussion at departmental meetings such as the monthly faculty meeting and the annual retreat.

Last updated 4/14/23