

Spring 2024 Core Curriculum IPRO (Interprofessional Projects) Assessment Report

This report should be a collaborative effort involving the Designation-level Assessment Coordinator, the evaluators and the Designation Subcommittee.

Core Curriculum Designation: Interprofessional Projects (IPRO)

Responsible Party: Core Curriculum Assessment Committee (CCAC); Mary Jorgenson Sullivan ELS (chair); Nick Menhart, BIO, DVP Accreditation, chair; Diane Ffiles, Asst Dir of Univ Accred; Mary Gabe Smith, UGAA; Gorjana Popovic, MATH; Nicole Ditchman PSYC; Priyanka Sharma SSB; Edoarda Corradi (CAE), Hannah Ringler (CAC)(On leave); Erin Hazard (HUM), Kelly Laas (Ethics); Joseph Renow (SOC), Todd Springer (PHYS)

1. CORE CURRICULUM LEARNING OBJECTIVES EVALUATED: List the Core Curriculum learning objectives that were evaluated in this assessment cycle.

Applicable Core Curriculum Learning Goals

Be committed to positive change in their communities, nations, and the world, able to

- Identify and analyze contemporary issues and problems.

Think critically, viewing problems as opportunities for innovation, able to

- Employ the best available technology to achieve solutions.

Collaborate professionally and ethically, able to

- Work successfully with others within and across disciplines and cultures.

Communicate effectively, able to

- Establish an objective, and clearly and cohesively support it.
- Speak and write appropriately within and across disciplines and cultures.

IPRO Learning Objectives

- 1. Open Ended Problem Solving:** Students will demonstrate the ability to contribute to solutions to open-ended problems of community and societal relevance that require an interdisciplinary approach
- 2. Teamwork:** Students will demonstrate effective interdisciplinary teamwork skills
- 3. Communication** Students will demonstrate their ability to effectively communicate across

<p>disciplinary boundaries</p> <p>4. Ethics: Students will demonstrate their ability to identify and evaluate the ethical implications of their solutions and actions.</p>

2. ASSESSMENT METHODOLOGY: Use the table below to describe your assessment methodology.

First Learning Objective		
Learning Objective Assessed	All learning outcomes assessed with the same methodology.	
Semester(s) in which artifacts were collected	Spring 2024	
Name of rubric used to evaluate student artifacts (<i>attach copy of rubric to this report</i>)	<p>Student artifacts matching each learning outcome were assessed on a (0, 1, 2) point scale. Standard Assessments and Rubrics were provided to the IPRO faculty, along with orientation to using the standard tools and support in doing so. For faculty that elected to develop their own assessments, they were asked to customize the standard rubric or develop their own rubric, which was then reviewed by a CCAC liaison. All rubrics were scaled to the following:</p> <ul style="list-style-type: none"> ● 0=does not meet expectations, ● 1= meets expectations. ● 2=proficient <p>The threshold for meeting expectations was the equivalent of 2.0/4. scale, (i.e. a C grade), as students are required to maintain a 2.0 overall GPA for graduation requirements. Proficient is the equivalent of 4.0/4.0 scale (i.e. an “A” grade).</p> <p>As each instructor will have different scaling in accordance with their own disciplinary expertise and expectations, the committee collaborated with course instructors in determinations of whether students met the learning objective expectations. This applies to learning objectives 1-3, whereas learning objective 4 was determined by direct assessment (by independent assessors from the committee and the Center for the Study of Ethics in the Professions).</p>	
Artifact source	Course(s) and Instructor(s): Artifact sources were distinct sections of IPRO 497; each	Assignment(s):

	developing a project based on areas of specialization (rocketry, neighborhood opportunity engines, for example)	Assignments included statements of contributions, peer evaluations, ethic reflections
Sample Size	Classes ranged in size from 12-51+ enrollments. The total sample population for this report was 350 for those courses that participated in the assessment. Compliance with the assessment process was limited; of 22 classes with a total enrollment of 596, 15 classes (68%) participated.	
Semester of Assessment/Evaluation	Spring 2024	
Names & Titles of the Evaluators	CCAC Committee	

3. ASSESSMENT RESULTS: Insert a table or graph summarizing the results.

See data charts in the discussion section

4. DISCUSSION OF RESULTS: Use this section to describe the key findings revealed in the interpretation of the data.

Participation and Coverage

The Interprofessional Projects designation of the core consists of 400-courses that are completed twice by third and fourth year undergraduates. Assessment of student achievement of the learning objectives was conducted in all the IPRO courses. Enrollment in the courses ranged from 12-51 so no courses were sampled: all enrollments were nearly ≤ 50 . This yielded a group of 22 classes with a total enrollment of 596 students.

Of these 22 classes:

- 7 were noncompliant, and either did not effectively communicate with the CCAC, or submitted artifacts that were not interpretable within the context of the LO assessed. These 7 classes had 243 enrolled students, or 41% of the 596 IPRO students in F23.
- 15 classes provided useful data. These 15 classes had a total enrollment of 353, and data were obtained for 350 of them, or 58% of the 596 students. Since there are 4 LOs, and in some cases data was obtained for only a subset of LOs for any given students. However in general, when a student was represented in the dataset, all 4 Los were assessed, with an overall 92% completion rate

This compliance rate is addressed in recommendations for the assessment process later in this report. Instructors were provided with standard assessments and rubrics for the assessments. In the case that instructors opted to modify the rubric or use their own assessments, they were asked to provide copies of the assessments and the rubrics to the CCAC. All artifacts were expected to be individual, authentic examples of student work. Instructors were then asked to provide a rubric to designate achievement level across three categories: Does Not Meet; Meets; and Proficient.

Independent Assessment

Assessment of the learning objectives for the IPRO designation revealed greater heterogeneity for LO 4: Ethics. This prompted committee members to conduct a Levene's Test for Homogeneity of Variance. The results showed that there was no homogeneity of variances in performance levels across IPRO classes for the LO1 ($F = 6.08 > F_{0.05,2,36} = 3.26, p < 0.05$), LO2 ($F = 6.30 > F_{0.05,2,33} = 3.28, p < 0.05$), and LO3 ($F = 3.33 > F_{0.05,2,36} = 3.26, p < 0.05$). In contrast, the results show the homogeneity of variances in performance levels across IPRO classes for LO4 ($F = 0.15 < F_{0.05,2,36} = 3.26, p > 0.05$). [LEVENE'S TEST FOR HOMOGENEITY OF VARIANCE.](#)

Achievement of Learning Objectives

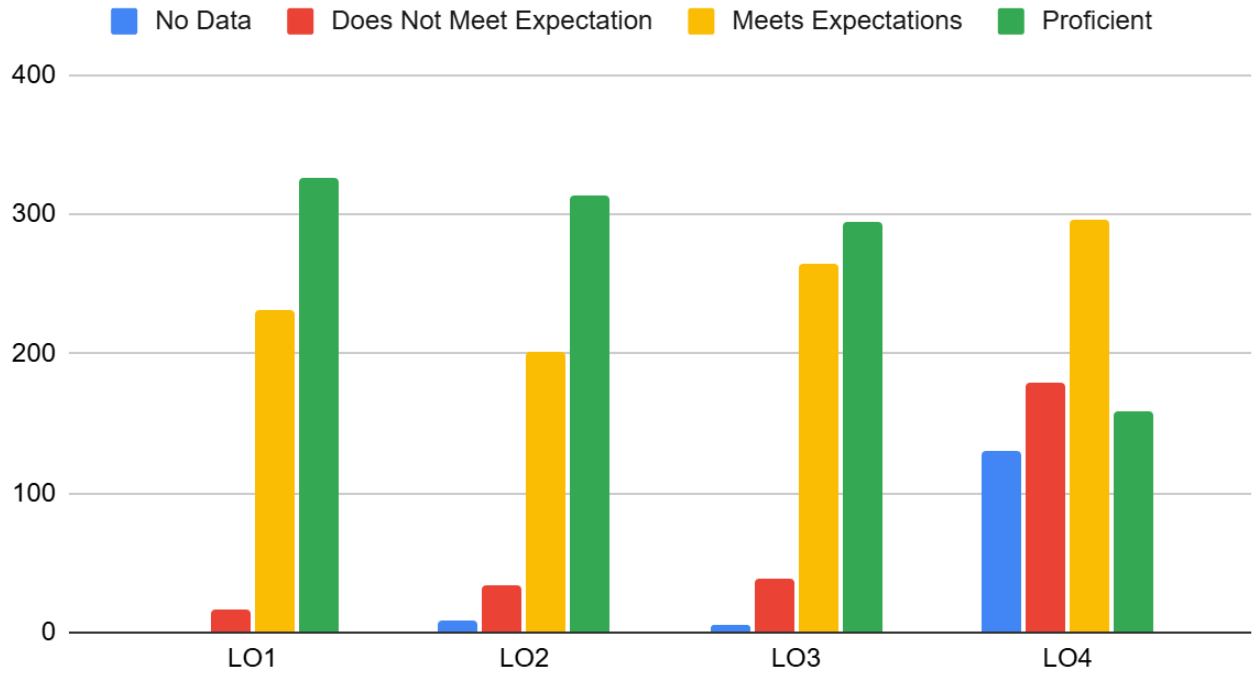
Overall

A summary of LO achievement is given here, and individual Los will be presented in more detail below

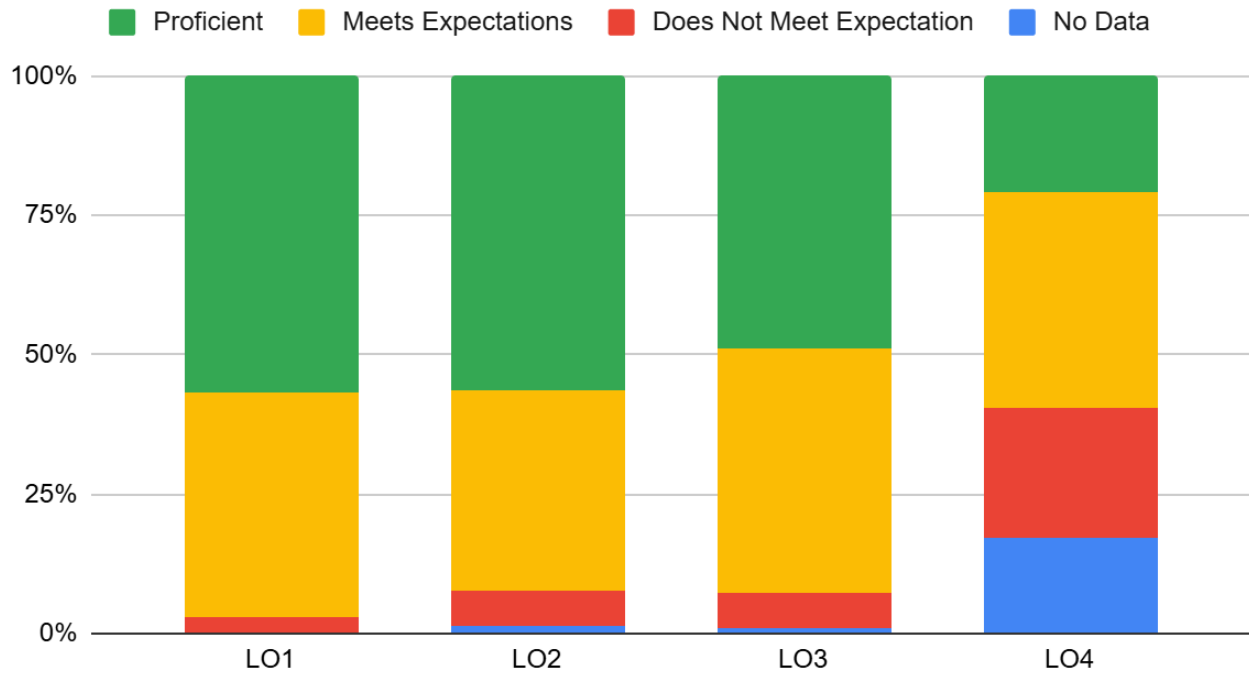
		N	D	M	P	m+p
OEPS	LO1	0.3%	3%	40%	57%	97%
TEAMWORK	LO2	1.4%	6%	36%	56%	92%

COM	LO3	1.0%	6%	44%	49%	93%
ETH	LO4	21.5%	30%	49%	26%	75%

All Learning Objectives: Compliant Classes Numerical



All Learning Objectives Compliant Classes Percentage

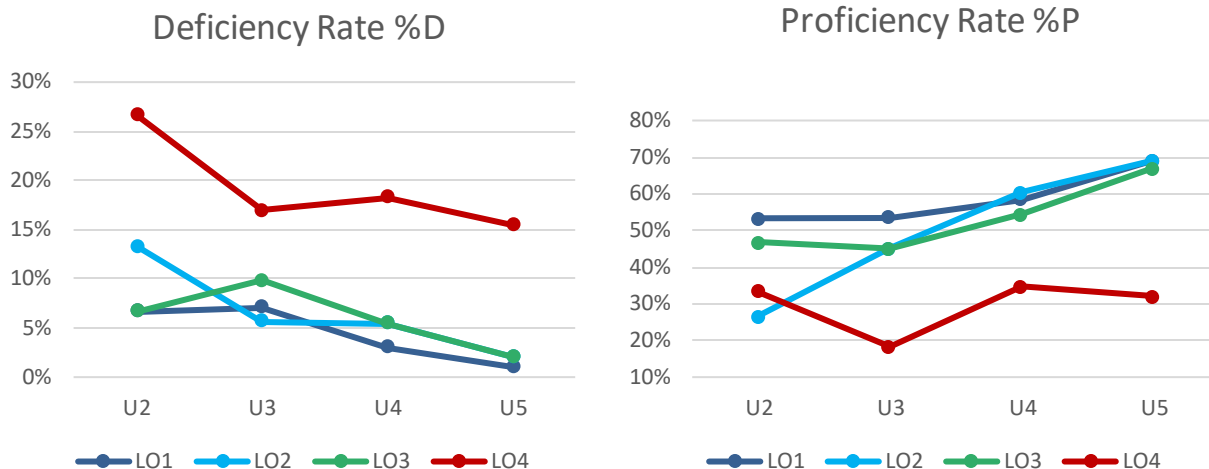


By Cohort

Interprofessional Projects, as an interdisciplinary program of Illinois Tech, is designed for completion by undergraduates in Year 3 and 4 of their degree program. Additionally, students complete two IPRO projects, thus developing their open-ended problem solving, teamwork, and communication skills as well as their understanding and application of ethical frameworks in the iterative completion. Data was aggregated to identify students' ability to achieve the learning objectives using these parameters. The results are indicated below.

Student Level

Achievement of Learning Objectives based on student level (U1-U5)*



*U2>30 ch, U3>60 ch, U4>90ch, U5>120 ch; U1 is not shown since there were only 2 U1 students were assessed, which does not provide a statistically relevant sample.

The percentage of students demonstrating proficiency in the learning objectives increased in a fairly uniform fashion as they progressed from U2 to U5.

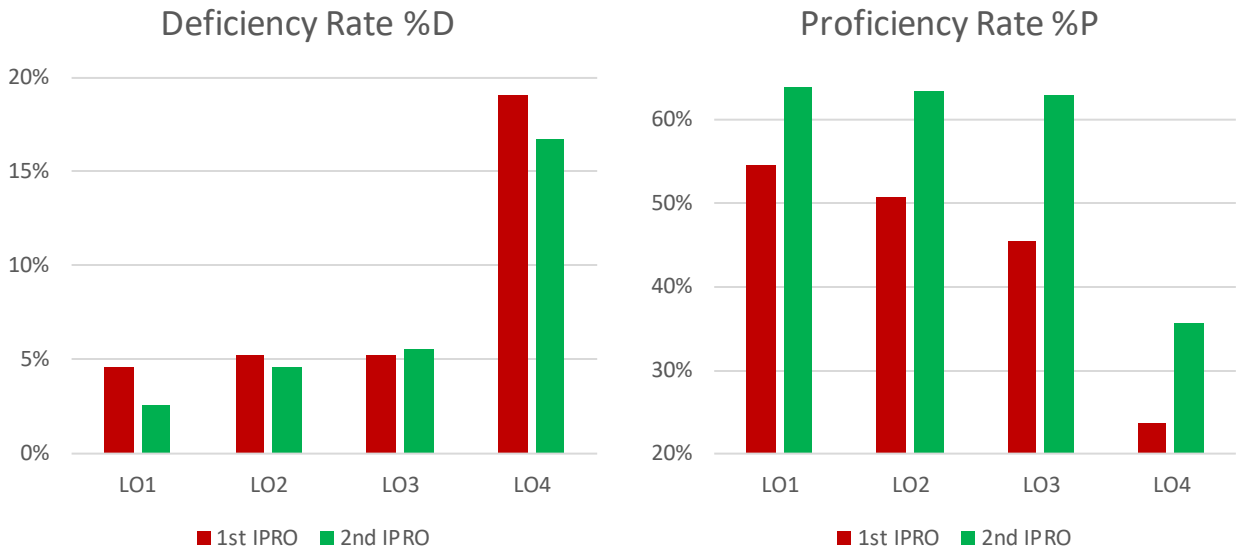
For learning objectives 1-3, the proficiency level (%P) increased with student level and the deficiency rate (%D) decreased with student level. For the Ethics learning objective, which had lower proficiency and higher deficiency rates overall, we see some evidence that deficiency decreases with student level; however, we do not see increase in proficiency level.

We also note the ethics LO, LO4, is clearly very different, with much higher deficiency rate, and much lower proficiency rate that does not improve with student level.

As an interdisciplinary program, IPRO requires students to use their disciplinary perspective to approach a complex, interdisciplinary problem. One hypothesis to explain this is that students have not been sufficiently engaged in their discipline in U1 or U2 to provide the necessary background and therefore struggle in the IPRO. **We recommend that IPRO consider restricting (prerequisite) or encouraging enrollment for only U3 and above students, who benefit more from the class.**

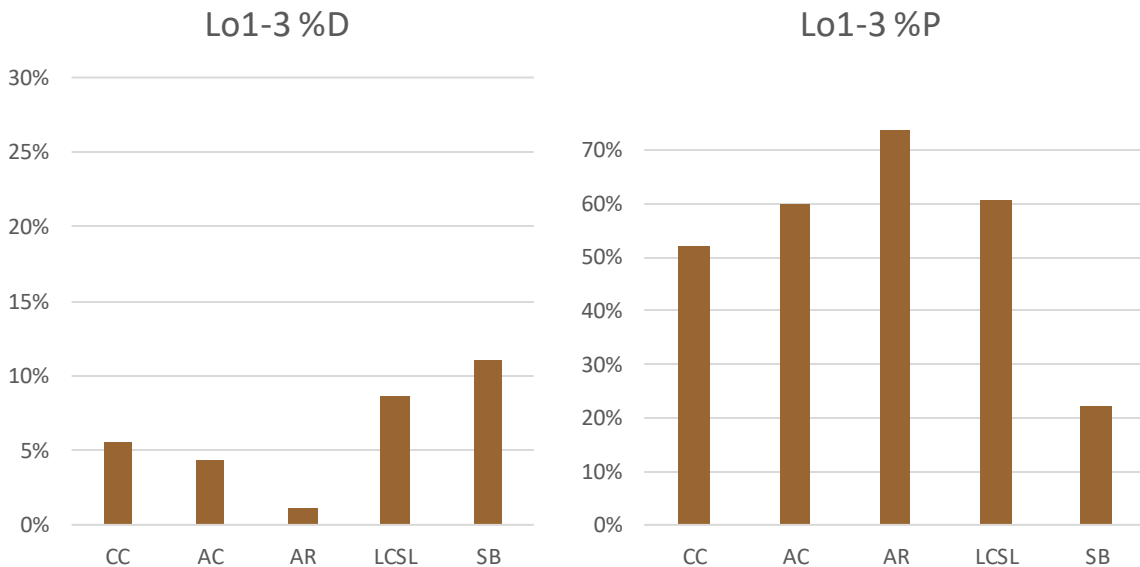
First or Second IPRO

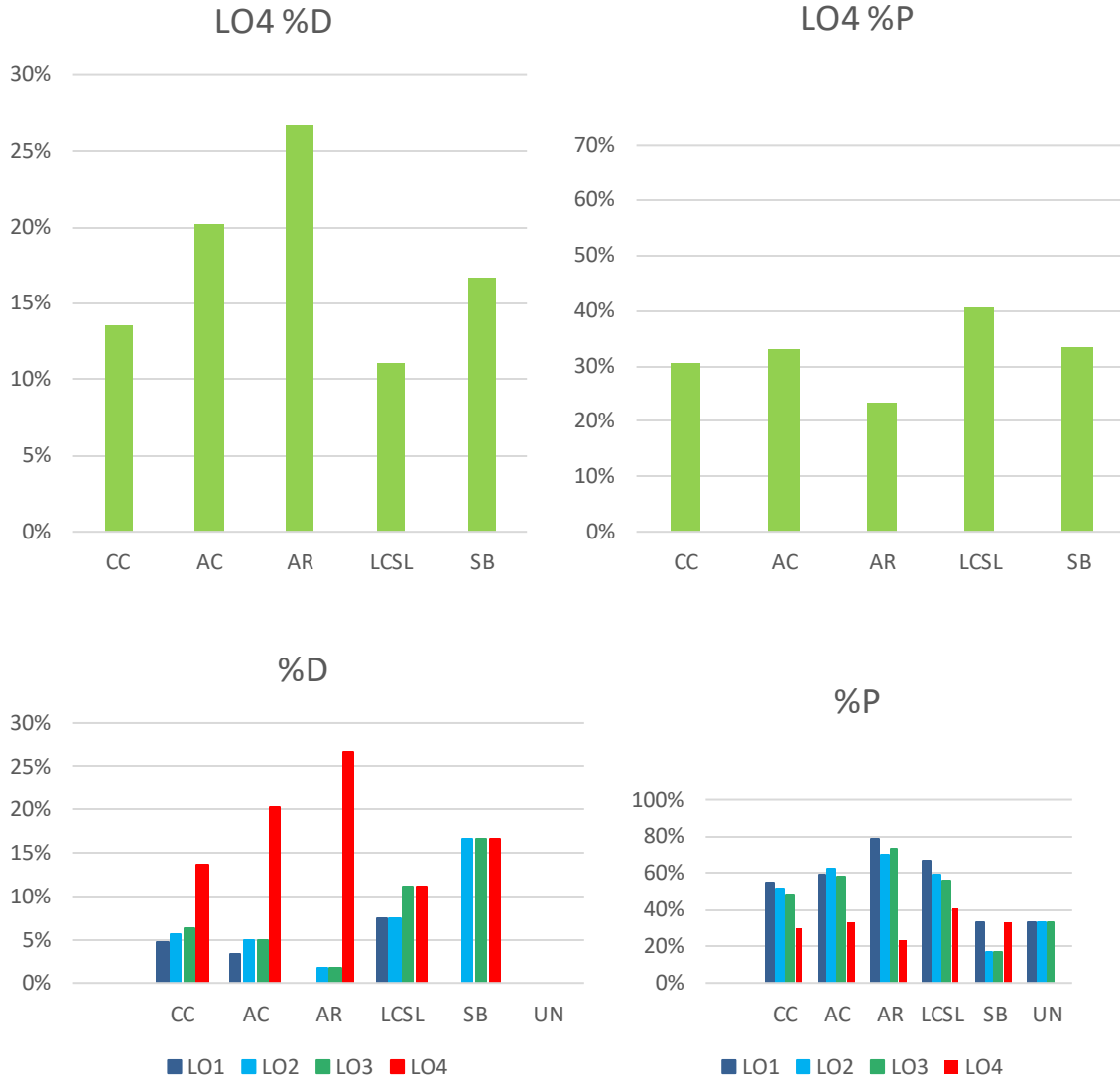
IPROs address complex problems and requires substantial, iterative engagement with the type of problem to be able to achieve the learning objectives in this context. A significant number of students engage in the same project for both IPRO courses; it would be interesting to see if these students achieved further gains (rather than students who completed two different IPRO courses). However, this was a single semester assessment and beyond the scope of the current assessment process. We recommend considering a two-semester assessment in the future to examine the correlation between completion of the same project and achievement of the learning objectives.



This provides evidence that a second IPRO improves student achievement of the learning objectives, reducing deficiency and increasing proficiency. While the reduction in deficiency(%D) in achieving the learning objective decreases slightly (in LOs 1,2, and 4) from IPRO 1 to IPRO 2, the proficiency level (%P) increases substantially for all learning objectives.

College





Deficiency and proficiency rates varied by college, and were fairly consistent for the “project management” LOs 1-3; with the Ethics LO#4 once again showing very different behavior.

Individual Learning Objective*

LO1: - Students will demonstrate the ability to contribute to solutions to open-ended problems of community and societal relevance that require an interdisciplinary approach.

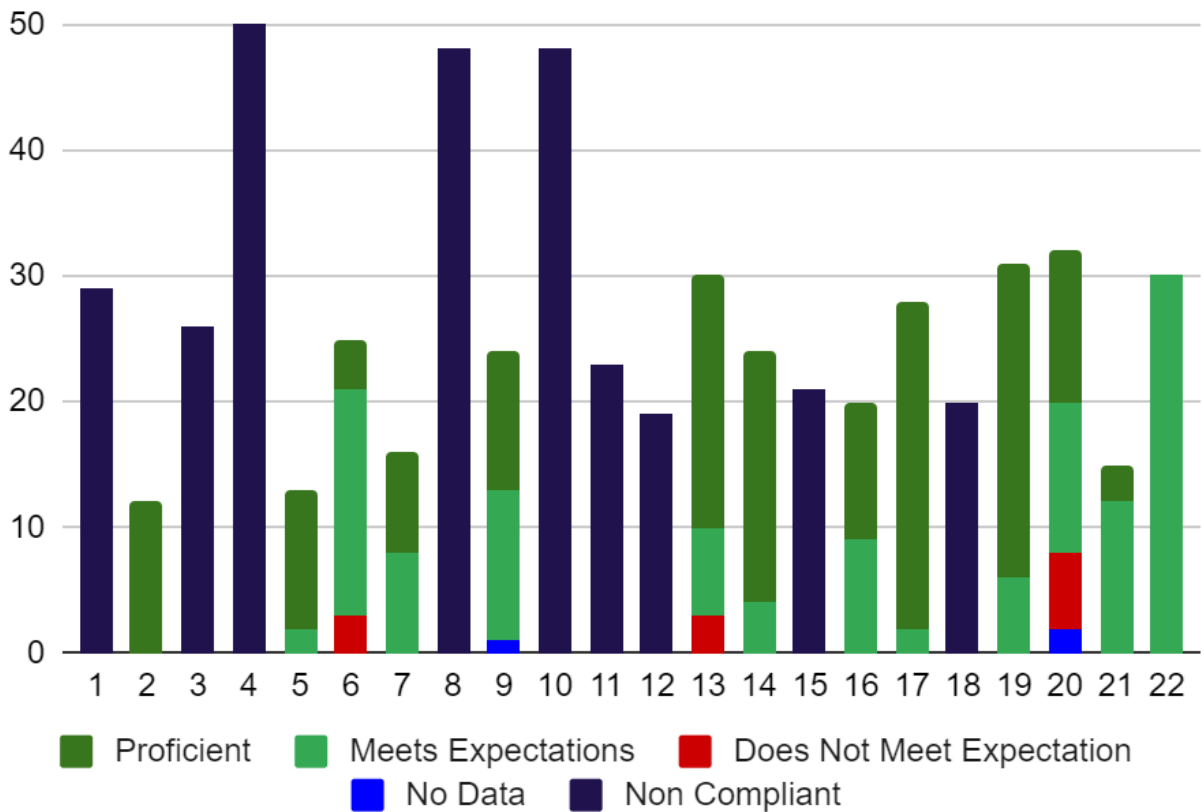
Student data by class is shown below, as well as the total for the groups. Of the students assessed 2% (12 students) did not meet (D) the learning objective, 21% (122) met (M) expectations and 28% (163) demonstrated proficiency (P) in this learning objective, while no data was obtained for .5% (3) student. **Missing data was due to students who withdrew, received an incomplete, or did not complete the assessment due to extenuating circumstances.**

However, as indicated above, compliance with the assessment of the learning objective was inconsistent; 49% (284) of students were in classes that were not compliant with the assessment process. While overall faculty compliance with providing artifacts increased from previous semesters and designation assessments, in numerous cases, faculty did not submit all artifacts OR did not submit a workable rubric OR the rubric did not align with the learning objective. This is a continuing issue and one that is addressed in the assessment process recommendations below.

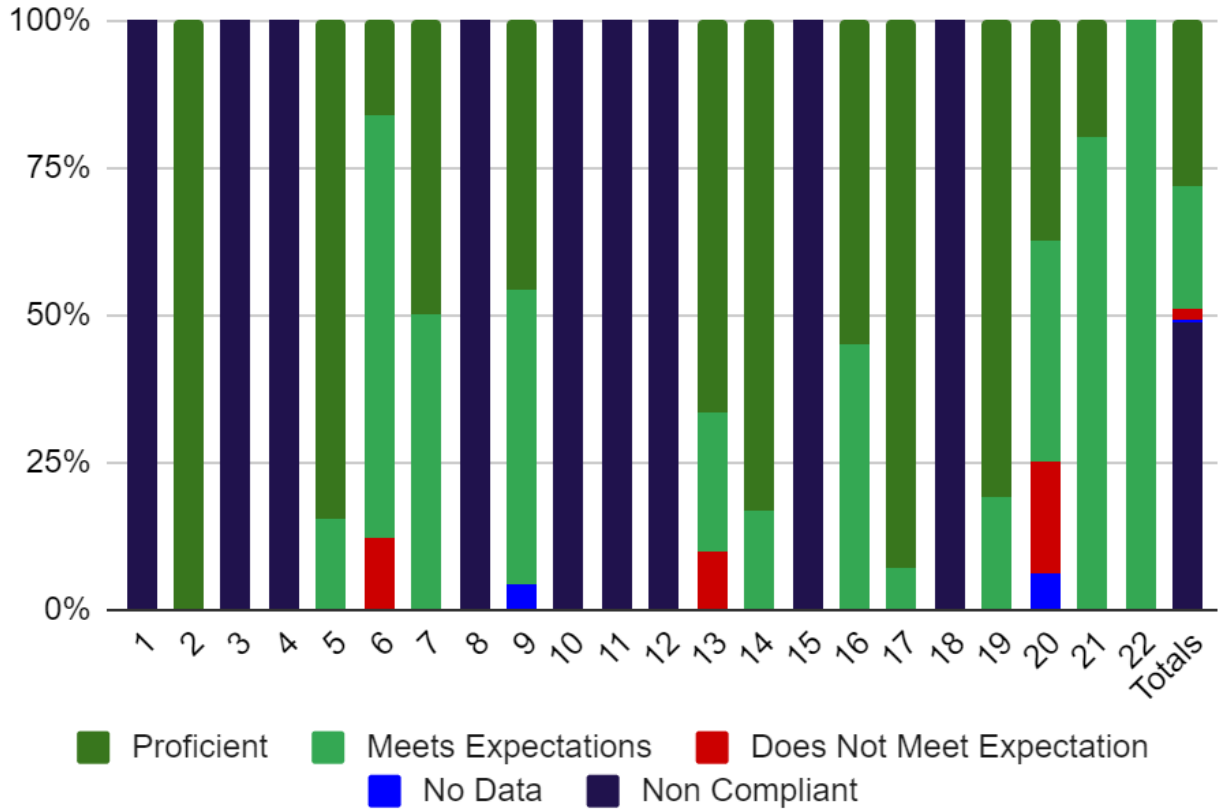
Based on the data for those classes that provided assessment information, it appears that this learning objective is being met. Open-ended problem solving is the most discipline-specific of the learning objectives.

**Learning objectives 1-3, Open-Ended Problem Solving, Teamwork, and Communication are intrinsically part of the IPRO teaching and learning to a greater extent than Ethics (LO 4). We observed greater focus on the first three skills throughout the IPRO courses than understanding of Ethics.*

LO 1 OEPS:All Classes Numerical



LO 1 OEPS: All Classes Percentage



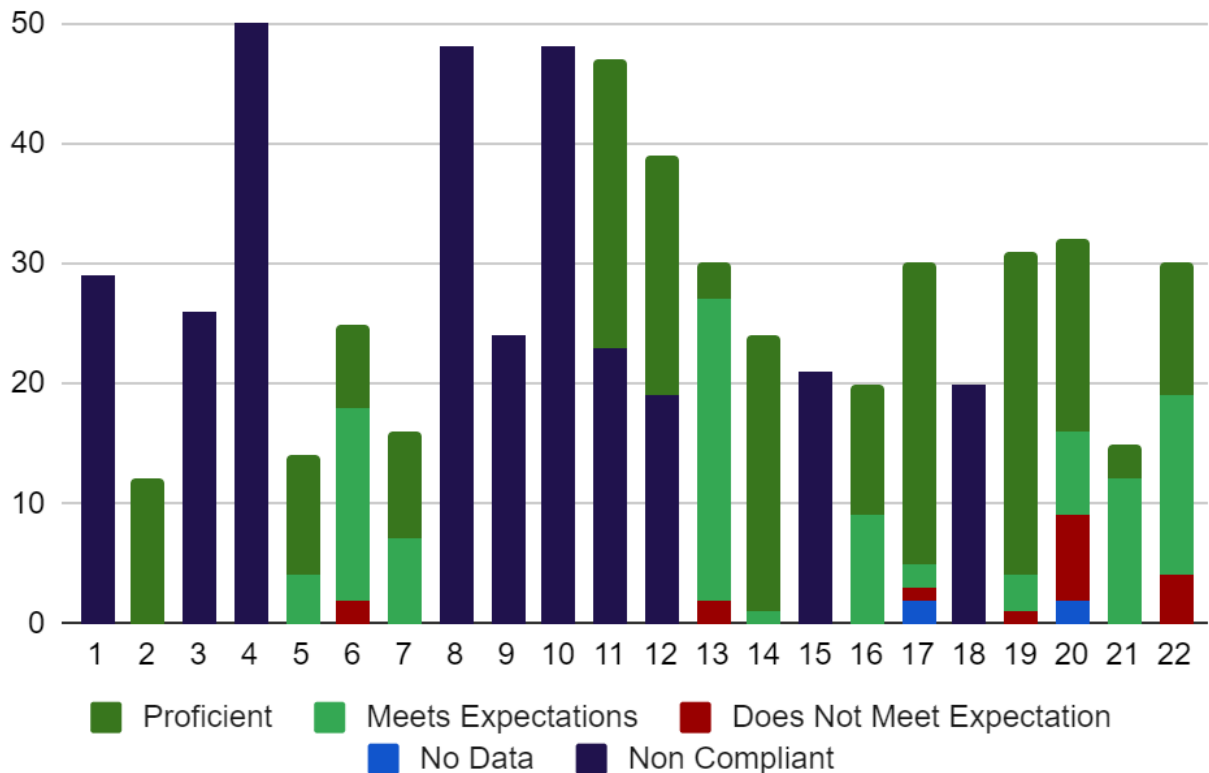
LO 2: Students will demonstrate effective interdisciplinary teamwork skills.

Student data by class is shown below, as well as the total for the groups. Of the students assessed 3% (17 students) did not meet (D) the learning objective, 16% (101) met (M) expectations and 32% (201) demonstrated proficiency (P) in this learning objective, while no data was obtained for .6% (4) students. **Missing data was due to students who withdrew, received an incomplete, or did not complete the assessment due to extenuating circumstances.**

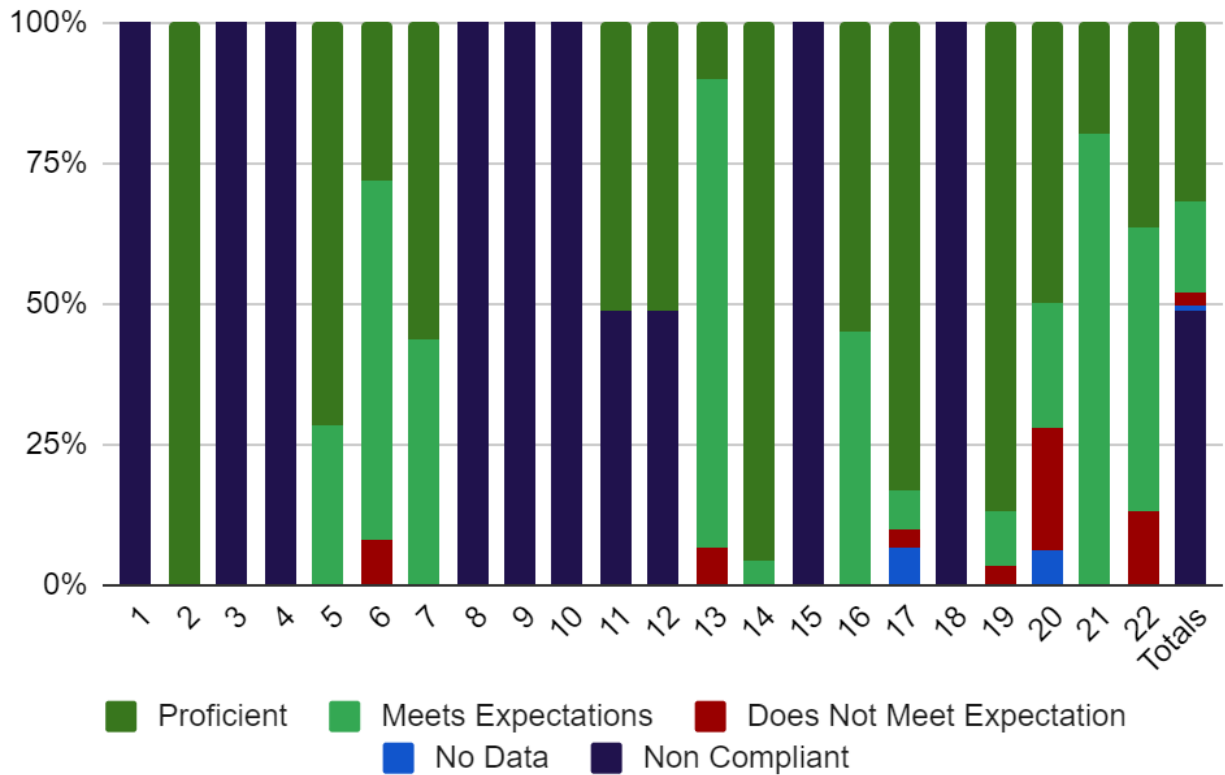
However, as indicated above, compliance with the assessment of the learning objective was inconsistent; 49% (308) of students were in classes that were not compliant with the assessment process. While overall faculty compliance with providing artifacts increased from previous semesters and designation assessments, in numerous cases, faculty did not submit all artifacts OR did not submit a workable rubric OR the rubric did not align with the learning objective. This is a continuing issue and one that is addressed in the assessment process recommendations below.

Based on the data for those classes that provided assessment information, it appears that this learning objective is being met.

LO 2 Teamwork: All Classes Numerical



LO 2 Teamwork: All Classes Percentage



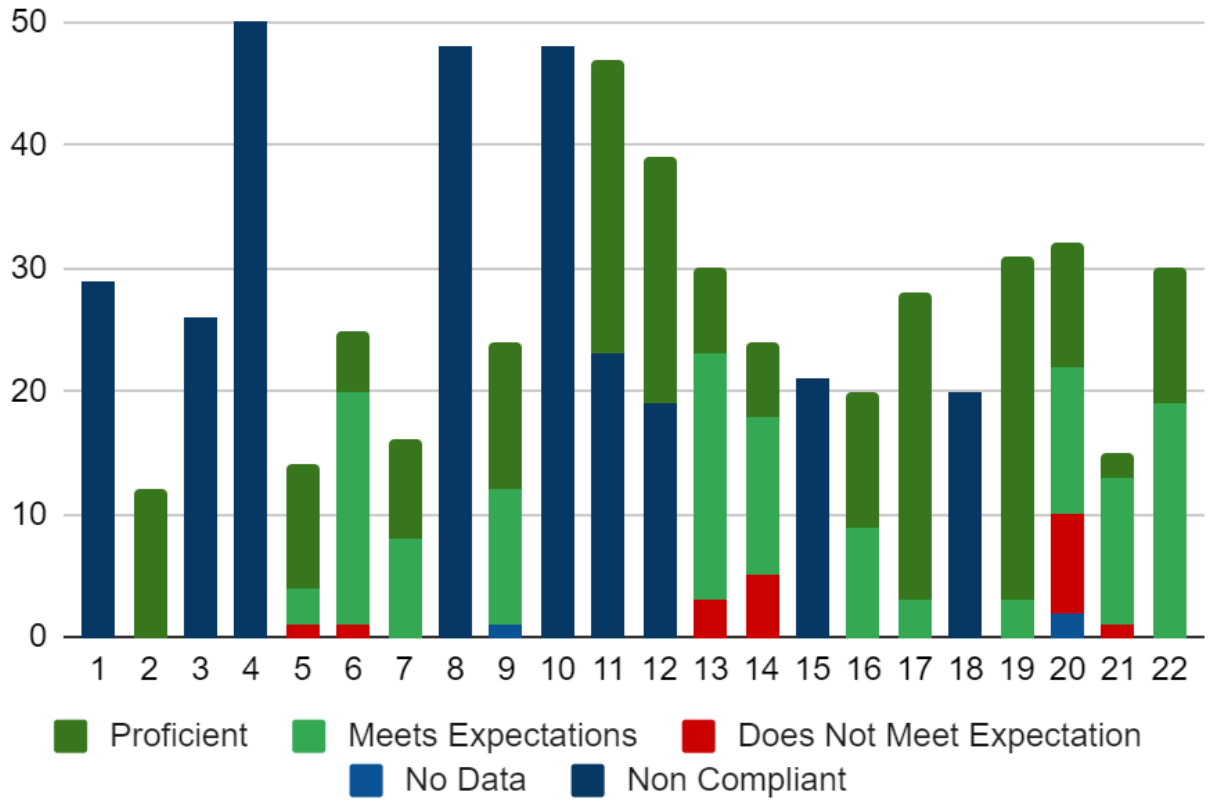
LO 3: Students will demonstrate their ability to effectively communicate across disciplinary boundaries.

Student data by class is shown below, as well as the total for the groups. Of the students assessed 3% (19) did not meet the learning objective, 21% (132) met expectations and 30% (191) demonstrated proficiency in this learning objective, while no data was obtained for .5% (3) of students.

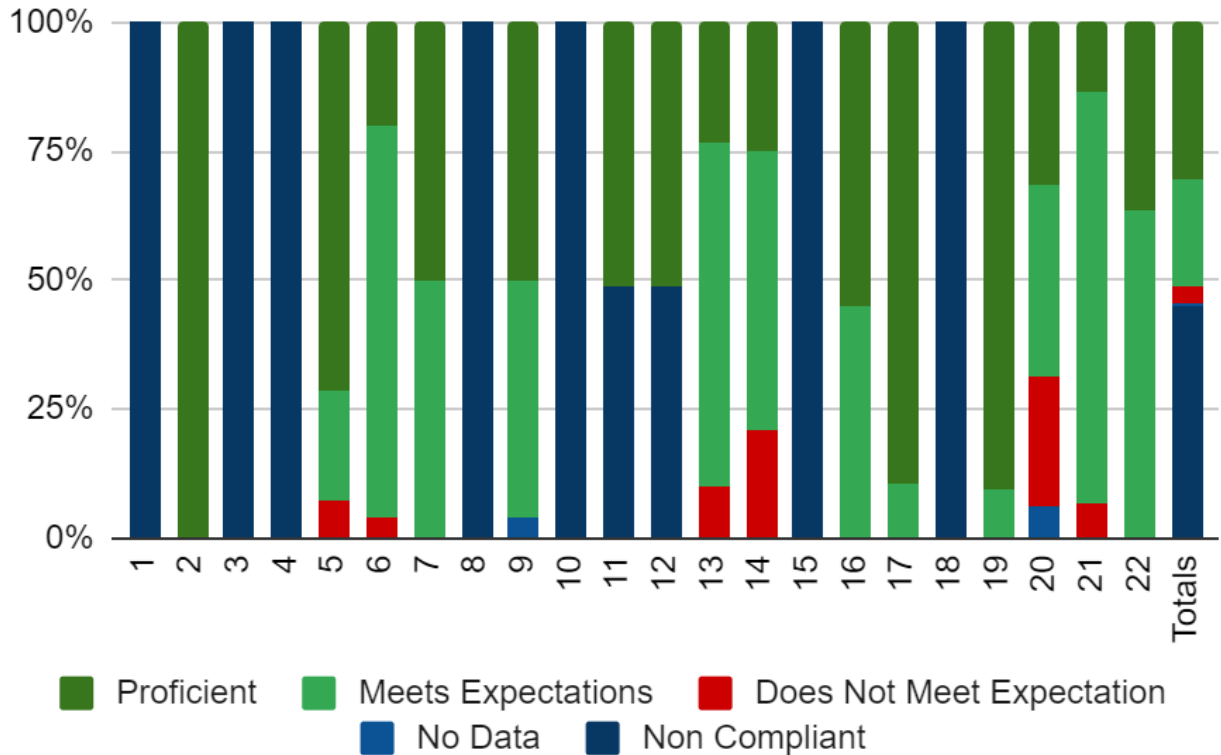
However, as indicated above, compliance with the assessment of the learning objective was inconsistent; 45% (284) of students were in classes that were not compliant with the assessment process. While overall faculty compliance with providing artifacts increased from previous semesters and designation assessments, in numerous cases, faculty did not submit all artifacts OR did not submit a workable rubric OR the rubric did not align with the learning objective. This is a continuing issue and one that is addressed in the assessment process recommendations below.

Based on the data for those classes that provided assessment information, it appears that this learning objective is being met.

LO 3: Communication: All Classes Numerical



LO 3: Communication: All Classes Percentage



LO 4: Students will demonstrate their ability to identify and evaluate the ethical implications of their solutions and actions.

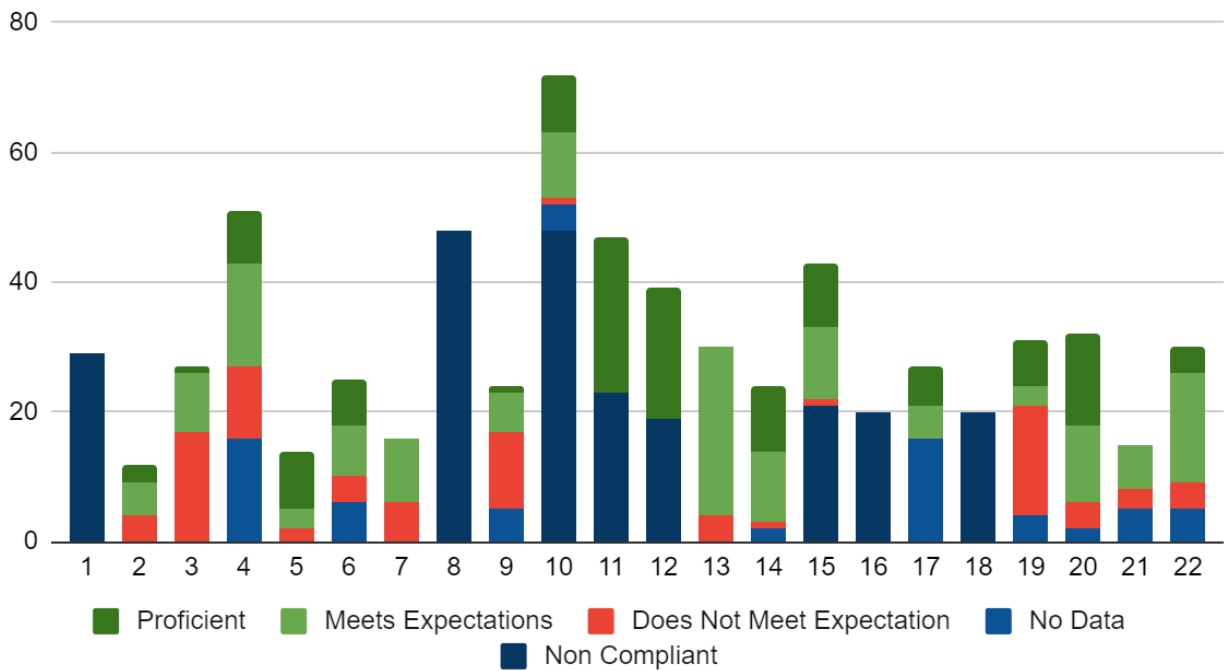
Student data by class is shown below, as well as the total for the groups. Of the students assessed 13.5% (91 students) did not meet (D) the learning objective, 23.5% (159) met (M) expectations and 20% (133) demonstrated proficiency (P) in this learning objective, while no data was obtained for 10% (65) students. **Missing data was due to students who withdrew, received an incomplete, or did not complete the assessment due to extenuating circumstances.**

However, as indicated above, compliance with the assessment of the learning objective was inconsistent; 34% (228) of students were in classes that were not compliant with the assessment process. While overall faculty compliance with providing artifacts increased from previous semesters and designation assessments, in numerous cases, faculty did not submit all artifacts OR did not submit a workable rubric OR the rubric did not align with the learning objective. This is a continuing issue and one that is addressed in the assessment process recommendations below.

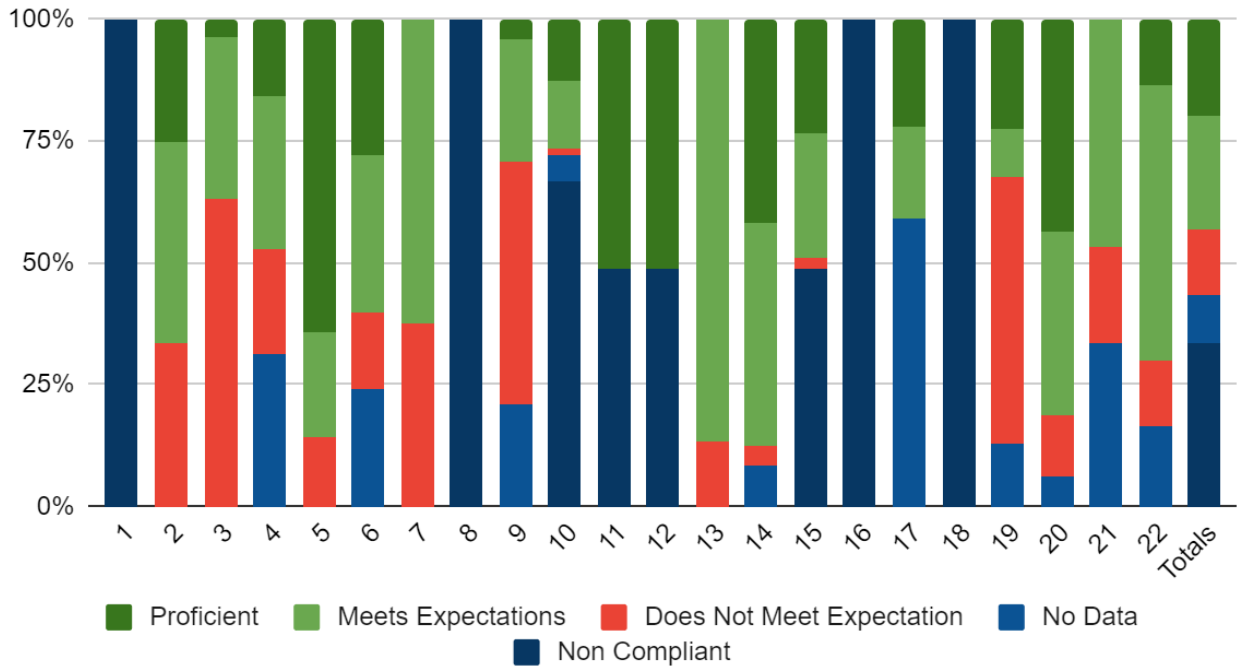
Based on the data for those classes that provided assessment information, it appears that this learning objective is being met.

Heterogeneity in the achievement of the Ethics Learning Objective is significant. This is likely a result of a more structured process put in place by the CCAC in which the assessment and rubric were developed by CCAC members and IPRO instructors under the leadership of the Center for Ethics in the Professions. Further, the assessment was conducted by the CCAC members after a norming session. Other learning objectives were assessed using CCAC/IPRO generated instruments, but the assessment was completed by the teaching faculty. This would point to greater reliability of the assessment, but greater need for delivery of instruction in preparation for the assessment, as levels of meeting expectation and proficiency are markedly lower.

LO 4 Ethics: All Classes Numerical



LO 4 Ethics: All Classes Percentage



5. IMPROVEMENT PLANS: Use this section to provide specific information about what elements of the curriculum may need to be modified in order to improve the program’s performance. *This section should be completed and signed by the UGAA Chair.*

Recommendations:

Pedagogical Recommendations:

We recommend the following changes to ensure greater achievement of the learning objectives and demonstration of student learning.

1. Student Level
 - a. Due to the indication of prerequisite skills needed for success in achieving the learning outcomes (specifically LOs 1-3), **we recommend that students be required to complete IPRO 1 in U3 and no earlier.**
2. 2 IPRO Recommendation:

- a. Students achieve significantly better learning (lower deficiency rate, higher proficiency rates) in their second IPRO. This is good evidence on two fronts:
 - IPRO does deliver on its LOs, since ALL LOs saw increased first to second IPRO
 - Students have not plateaued and are still significantly benefiting from the second IPRO

When IPRO was designed, it was designed as a 2-semester sequence, with the hypothesis that students need at least two semesters to become proficient at the complex LOs associated with experiential learning. **This provided evidence to back that up and we thus support the maintenance of a two semester IPRO experience.** We also note that a minority of students take a 3rd or more IPROs, and we recommend examining these students to understand this behavior.

3. Ethics

We note that:

- a. The Ethics LO was achieved significantly less well than the other LOs, with much higher deficiency and lower proficiency rates than the other LOs
- a. We also note that ethics is only specifically addressed elsewhere in the core in ITP, and our earlier ITP assessment noted significant non-compliance with the ITO ethics LOs. It is a logical inference that the lack of delivery with this foundational ethics pedagogy in ITP results in poor ethics ability in IPRO classes, which are taken after ITP in almost all cases.
 - NB Ethics courses are available but not required in other areas, such as HUM, but ethics is not part of HUM core LOs, and students may not take these specific ethics courses, opting for other courses for their H requirements.

To address this we recommend:

- **systematic and foundational ethics training in the core, either reinforced in ITP, or developed in some other areas, similar to that developed by disciplinary experts in the Center for the Study of Ethics in the Professions for IPRO.**

Process Recommendation

4. Direct Assessment: Based on our experience of direct assessment (assessment by members of the CCAC committee in addition to or instead of instructors), in which we were able to calibrate samples against a standard rubric, we recommend direct assessment going forward, where possible under budget and time constraints for faculty.
5. Standard Materials for IPRO: Standard assessments were developed for the MATH and IPRO assessments; in both assessments, we've observed that use of a standard assessment enables greater consistency of assessment and compliance. Therefore, we recommend promulgating standard materials to familiarize instructors and make assessment consistent.

6. Since students achieved more in a second IPRO, we wonder if these gains are restricted to students continuing in the same project in their second IPRO. This can be seen in even students taking heterologous IPROs. This is beyond the scope of this single semester assessment, but we recommend a two semester assessment of IPRO next cycle
7. IPRO teams participate in Innovation Day, a culmination of each project in which teams are judged by industry professionals in a competition. However that assessment is by team, not by students. Nonetheless, this could provide independent assessment data as specific students were linked to specific presentation teams. This did not occur last cycle, but it potentially could. We recommend the IPRO office work toward this in the future.