

# CSU Maritime Academy – Institution-Wide Assessment Council (IWAC)

AY 2024-2025

Annual Learning Results Institution Wide SLO (B): Critical and Creative Thinking



## Year 3 Report on Institutional Learning Outcome (ILO) B: Critical and Creative Thinking

“Comprehend, analyze, and objectively evaluate information and ideas; approach issues in new and different ways, often through synthesizing or applying information”

### OBJECTIVES

- Measure the extent to which Cal Maritime students “comprehend, analyze, and objectively evaluate information and ideas; approach issues in new and different ways, often through synthesizing or applying information”
- Give recommendations for improving assessment efforts.
- Give recommendations (where applicable) for improving program effectiveness.

### METHODOLOGY

In Academic Year 2023-2024, chosen faculty assessed ILO-B, Critical and Creative Thinking. Data were requested from all major granting departments and gathered from artifacts assessed by faculty in their respective courses using one 6-point rubric (see Appendix B) across the following four dimensions:

- Analysis of Evidence
- Application and Synthesis
- Comprehension
- Influence of Context and Assumptions

Note: In Academic Year 2023-2024, ILO D: Lifelong Learning was removed as it is assessed through a combination of ILO-B: Critical and Creative Thinking and ILO-F: Information Fluency. Therefore, a revised rubric was used for data collection in fall 2023.

For both introductory and mastery levels, FET and MET were combined into ET and all MEs were combined into one major category, regardless of concentration.

At the **introductory** level, 33 assessments were gathered from only **two** sections of EGL 220: Critical Thinking, one out of four sections (13 out of 72 students) in fall 2023 and one out of four sections (20 out of 69 students) in spring 2024.

On the **mastery** level, 209 assessments were gathered from the following major-specific upper division courses.

- BUS 301, International Business II (one section offered fall/spring; assessed in spring 2024 only)
- ENG 310, Engineering Ethics (two sections offered in spring; all sections assessed)
- GMA 460, Senior Thesis (one section offered in fall and was assessed)
- ME 494, Project Design II (one section offered in spring and was assessed)
- MGT 440, Logistics Cases and Analysis (one section offered in spring and was assessed)
- NAU 435, People, Planet, Profession (two sections offered in spring; all sections assessed)
- OCN 395, Science of Waves (one section offered and was assessed)

At the mastery level, several students were assessed in more than one course. Rather than average their scores together, IWAC agreed to keep their individual scores and count them as separate assessments, especially since different faculty and different artifacts were being used.

- IBL had 13 out of a total of 23 students that were assessed in BUS 301 and MGT 440
- ME had 26 out of a total of 29 students that were assessed in ENG 310 and ME 494
- MT had 1 out of a total of 70 students that was assessed in NAU 435 and OCN 395

## RESULTS

The benchmark remained at 70% of student artifacts to score 4 or above on a 6-point scale and is presented by major only. In addition, the **average outcome score** by major, gender and ethnicity are presented for all dimensions with a benchmark of 70% (4.2 or above on a 6-point scale). Note that a score on the rubric of 3 or 4 is emerging and a score of 5 or 6 is mastery.

### Introductory

Due to the small sample size assessed in EGL 220 (less than 10 per major), IWAC agreed it was not useful to graphically show the number of students who scored a 4 or above on the rubric. Instead, data is presented by the average outcome with a benchmark of 70%. Figure 1 represents the data presented by major. GSMA (n=4) met the 70% benchmark in all dimensions. Not unexpectedly, the institution wide averages were all below 70% in all four dimensions.

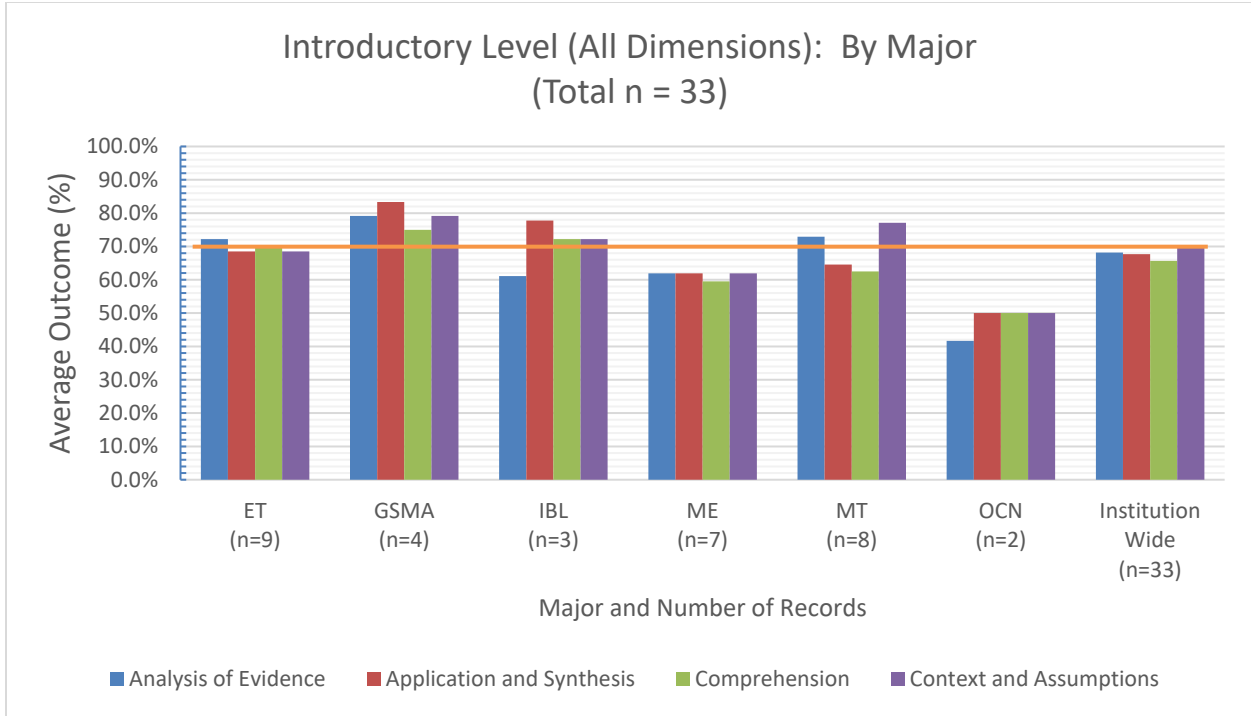


Figure 1, Introductory Level (All Dimensions) by Major

Figures 2 and 3 represent introductory data by gender and by ethnicity.

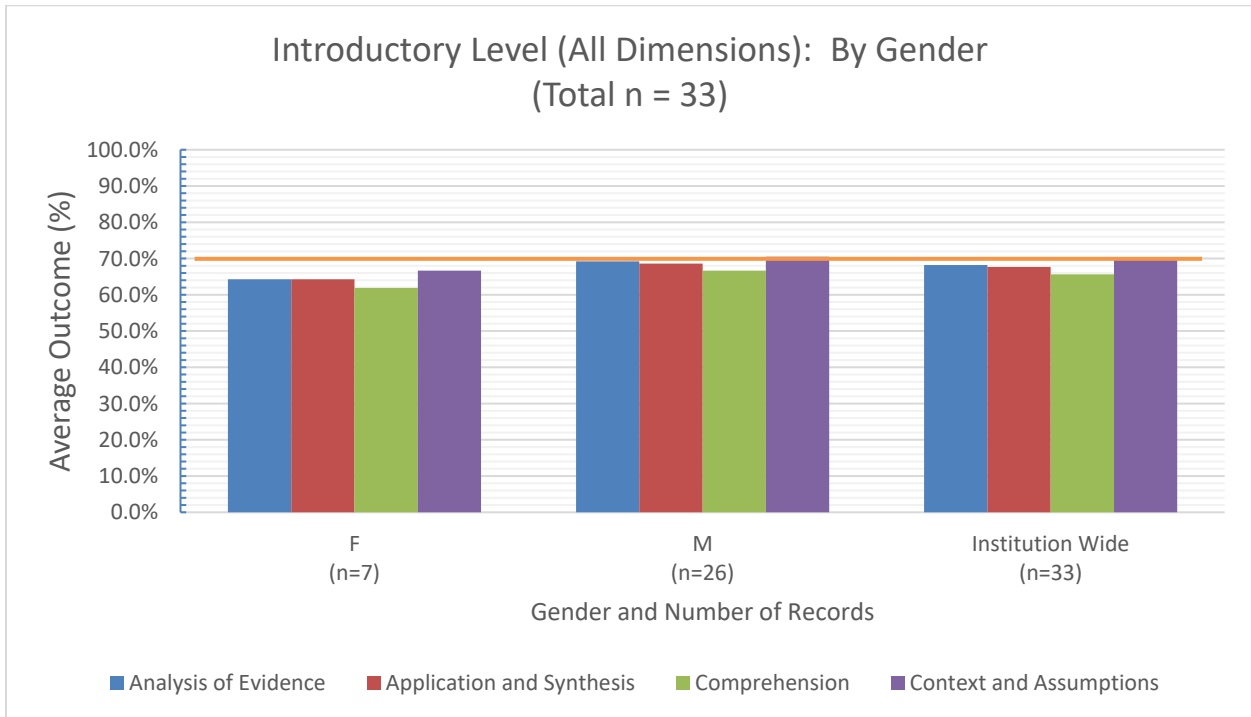


Figure 2, Introductory Level (All Dimensions) by Gender

In looking at Figure 2, if 23% of the students taking EGL 220 can be considered a representative sample, then regardless of gender, our students are under the benchmark for a 70% average outcome in all dimensions.

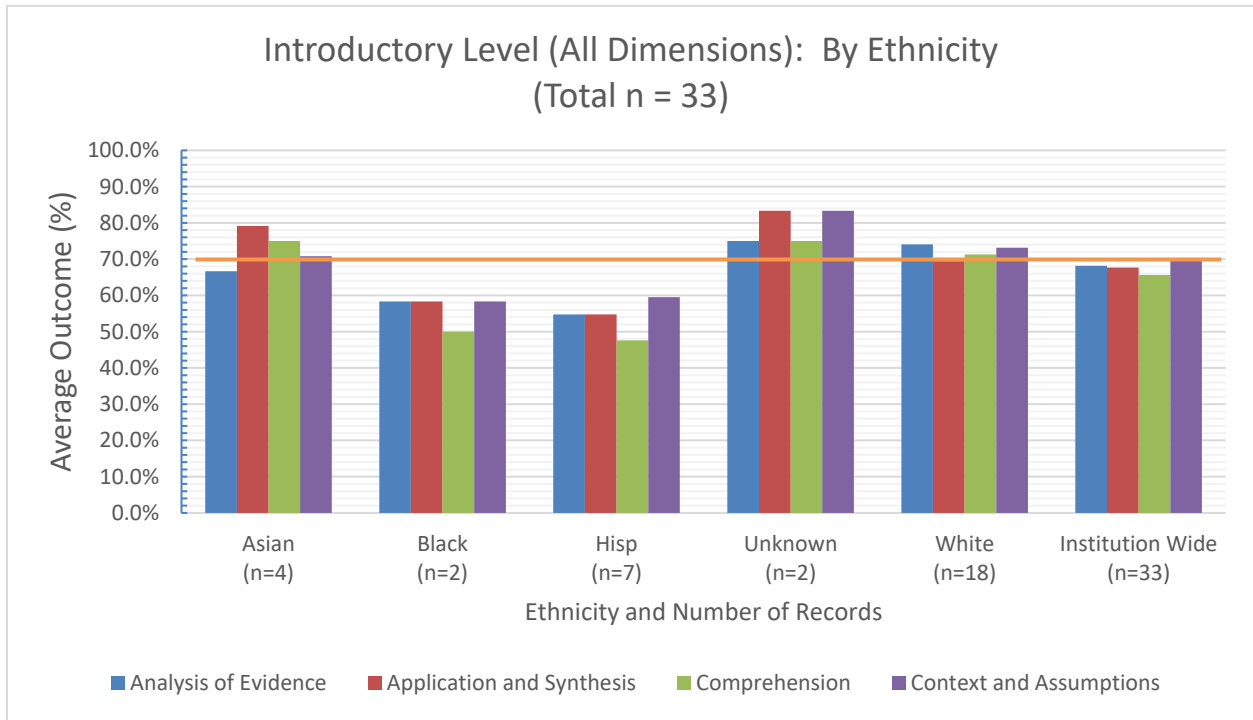


Figure 3, Introductory Level (All Dimensions) by Ethnicity

In looking at Figure 3, if 23% of the students taking EGL 220 can be considered a representative sample, then the two categories of black and Hispanic fall below the benchmark of a 70% average outcome in all dimensions.

### Mastery

Faculty assessing ILO-B at the mastery level are to be commended as a total of 209 assessments were completed.

In looking at Figure 4, the percent of students scoring a 4 or better in all dimensions across all majors was well above the benchmark of 70%. Given these results and that the institution wide percentages were all well above 90%, IWAC determined that providing similar data by gender and ethnicity was not useful in drawing any constructive conclusions and/or recommendations.

Therefore, data at the mastery level is presented by major, gender and ethnicity by the average outcome in each dimension with a benchmark of 70% (4.2 on a 6 point scale)

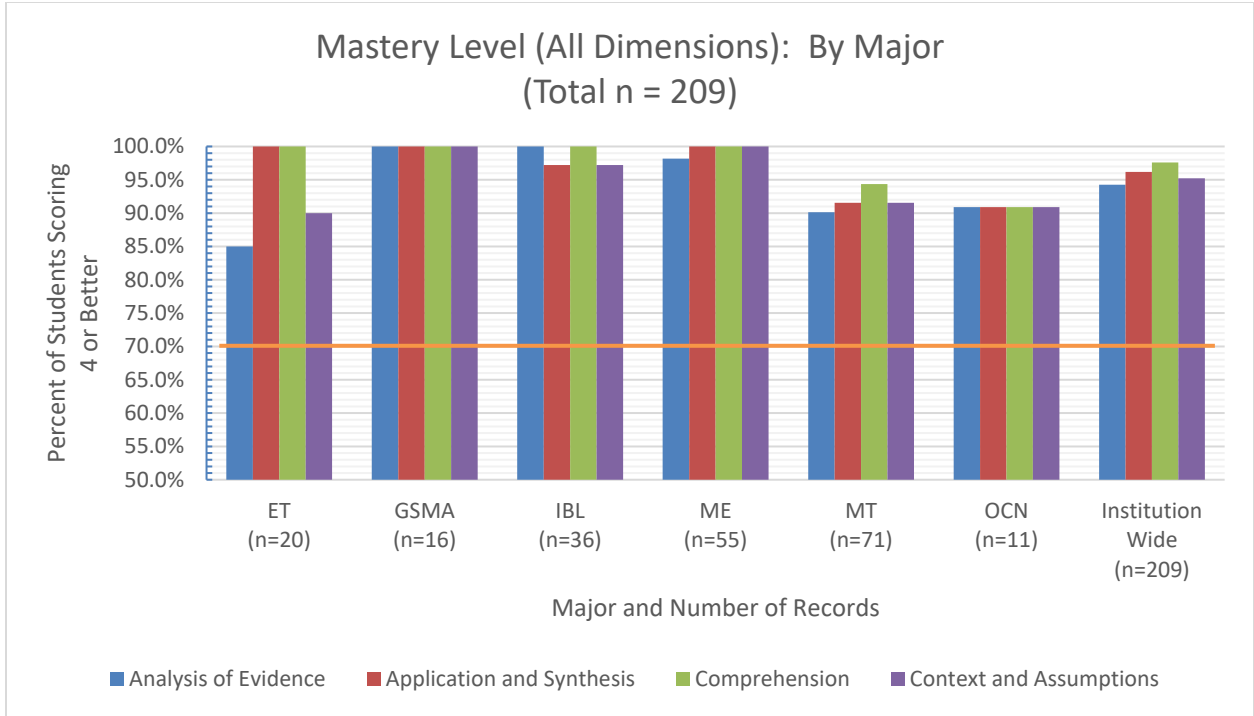


Figure 4, Mastery Level (All Dimensions) by Major: Percent of Students Scoring 4 or Better

Figure 5 represents data at the mastery level by major and figure 6 represents the percent increase from the introductory level.

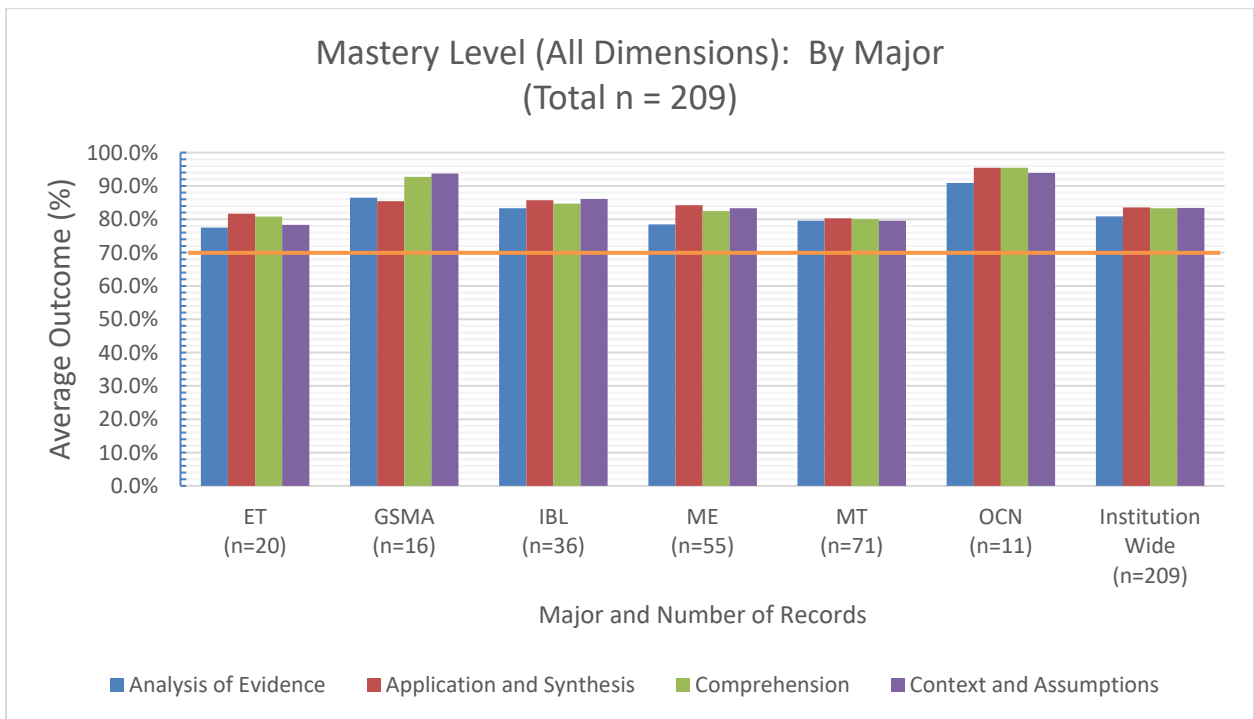


Figure 5, Mastery Level (All Dimensions) by Major: Average Outcome

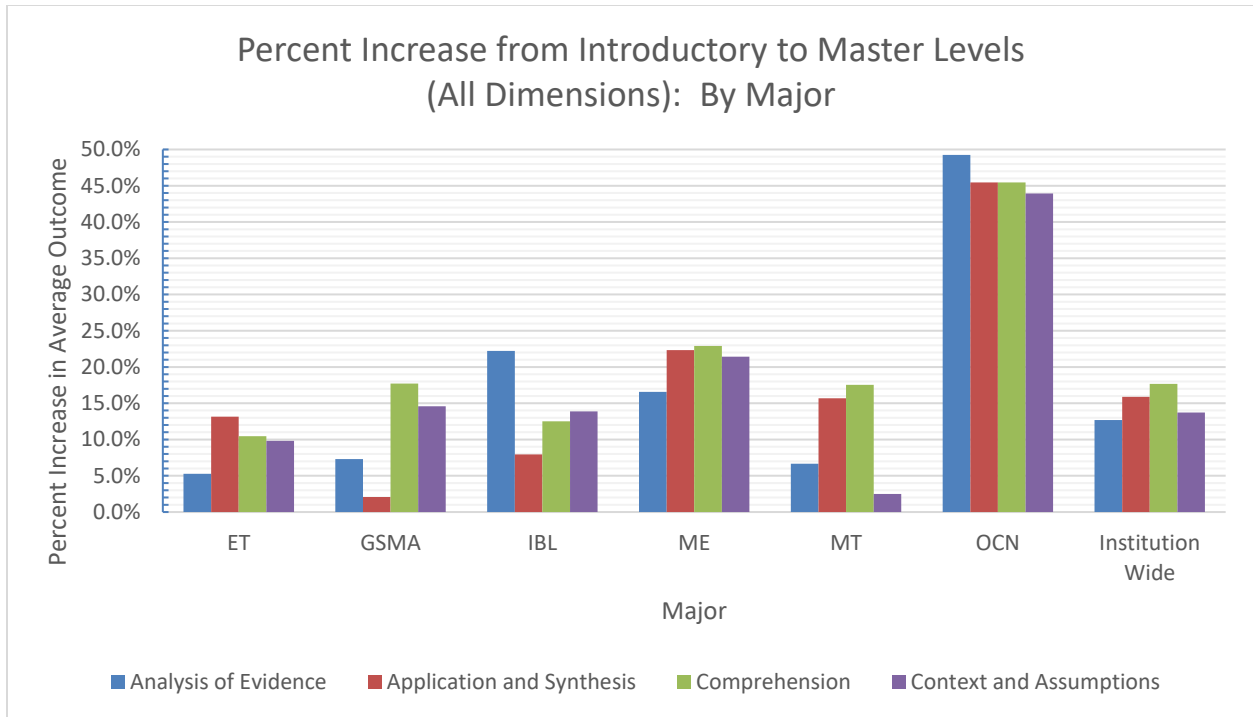


Figure 6, Percent Increase from Introductory to Mastery Levels (All Dimensions) by Major

In looking at figures 5 and 6, it is evident that **all** curricular programs at Cal Maritime are showing an increase in average outcome score across all dimensions. This is a significant and positive finding. Since Cal Maritime is not assessing students individually as they progress from the introductory level to the mastery level, this data shows that progression through individual curriculums improves a student's ability to meet the ILO-B objective.

Figure 7 represents the average outcome percentage by gender across all dimensions. When compared to the introductory level results in figure 2, there is an increase in the average outcome percentage as it relates to gender. Since the sample size for non-binary is small, no concrete conclusions can be made.

Figure 8 represents the average outcome percentage by ethnicity across all dimensions. When compared to the introductory level results in figure 3, there is an increase in the average outcome percentage as it relates to ethnicity.

The data in figures 5-8 also seem to suggest that there are no biases toward gender or ethnicity when assessing critical and creative thinking within each curriculum.

GSMA was the only program that met the benchmark of obtaining an average outcome in each dimension of 70% at the introductory and mastery level. In addition, GSMA was the only program that attained 100% of their students scoring a 4 or above at the introductory and mastery levels.

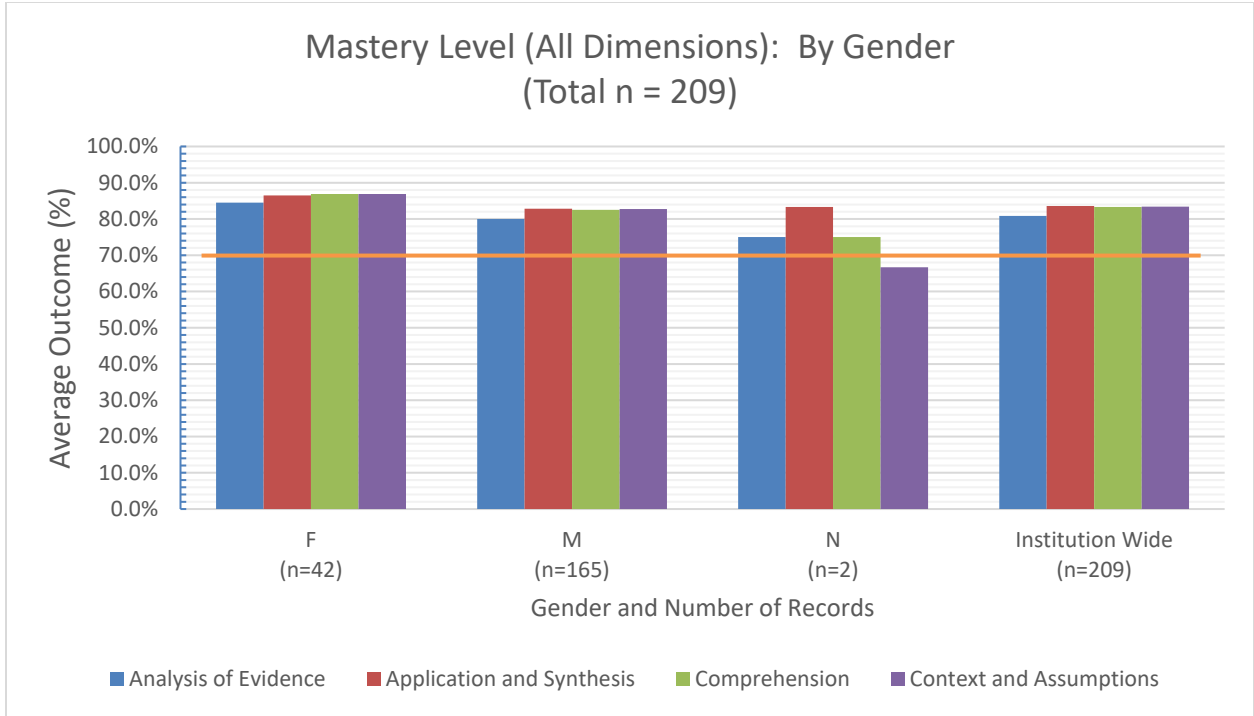


Figure 7, Mastery Level (All Dimensions) by Gender: Average Outcome

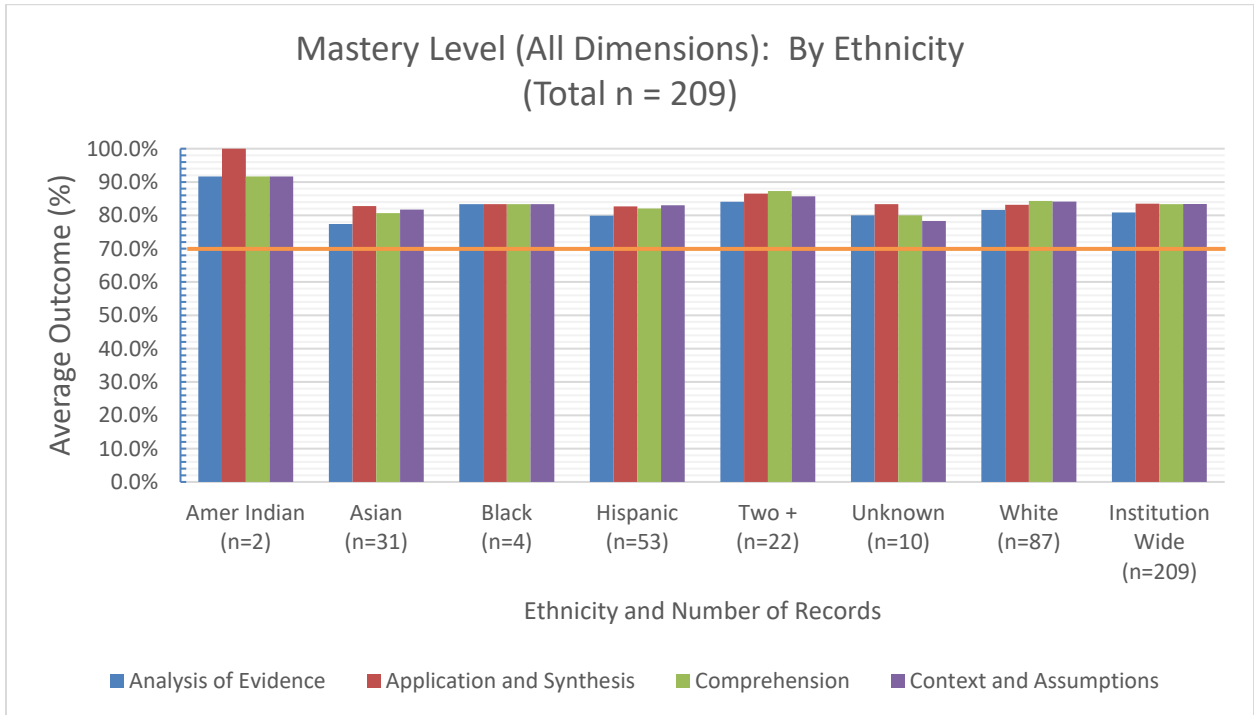


Figure 8, Mastery Level (All Dimensions) by Ethnicity: Average Outcome

Apart from a low level of introductory level evidence received from EGL 220, this cycle achieved a significant increase in evidence received at the mastery level. This success was due in part to

the specific rubric identification, course identification, identification of faculty teaching each course and their commitment to the process, a fall mid-semester assessment committee meeting, and integration with rubrics in Canvas.

IWAC notified instructors well in advance of the semester that their classes were identified for data collection, and provided rubrics, ongoing support and reminders, training sessions via Zoom in both terms, and monitoring of results. From the previous report, additional recommendations that were not applied in this cycle:

- (To ensure continuity between cycles, norming sessions should be held). Instead, artifacts were identified and assessed by the faculty teaching the courses.

## RECOMMENDATIONS

### Assessment Efforts

The following recommendations are meant to address the assessment process and should be implemented by IWAC.

- IWAC spent a considerable amount of time during the summer 2024 meeting addressing how best to obtain year three assessment data and to obtain buy-in from faculty and staff associated with the process. This information will be addressed in the 2024 IWAC Executive Summary report and at the summer 2024 faculty retreat prior to the start of the fall 2024 term.

### Program Effectiveness

The following recommendations are meant to address the findings in each program and should be reviewed by each department.

- It's difficult to assess program improvement without having more evidence at the introductory level. For example, IWAC feels that GSMA could look at what they can do within their curricular program to improve the average outcome percentage in application and synthesis (only 2.1% increase from introductory to mastery levels). Similarly, MT could look at improving the average outcome percentage in context and assumptions (only 2.5% increase from introductory to mastery levels). At the other end of the spectrum, OCN showed the greatest increase in average outcome percentage across all dimensions (greater than a 40% increase) which would seem to indicate that they are doing something incredible to improve student's critical and creative thinking skills as they progress through their program. This information should be shared so that other programs could benefit from what OCN is doing in their program. However, due to the low number of introductory assessments received, the end observations may be completely different.



- This is something IWAC struggles with since the mastery data clearly shows that our students are meeting the original benchmark associated with this ILO upon graduation. But if Cal Maritime wants to show continuous improvement, they must do a better job at obtaining assessments at the introductory level so IWAC can make appropriate comparisons and recommendations.
- EGL 220 is currently the only course being used to attain introductory level evidence. In many curriculum roadmaps, EGL 220 is taken in the sophomore year and therefore, the results may indicate a "reinforced" level instead of introductory level. IWAC is asking each major granting department to identify, if applicable, courses where critical and creative thinking could be assessed in the first year.
- Since the benchmark of 70% of students scoring a 4 or better on a 6-point scale was clearly met, recommend raising the benchmark to 80% or recommend removing the metric altogether. IWAC would welcome the feedback on whether this is a valuable metric for this ILO. For example, GSMA met the standard of 70% of students scoring a 4 or better at **both** the introductory level and at the mastery level on all four dimensions. Since individual students are not being assessed as they progress from introductory to the mastery level, does this information provide GSMA with any useful data to improve their curricular program?

## APPENDIX A: SUMMARY OF DATA

### Introductory Level

Major	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
ET (n=9)	72.2%	68.5%	70.4%	68.5%
GSMA (n=4)	79.2%	83.3%	75.0%	79.2%
IBL (n=3)	61.1%	77.8%	72.2%	72.2%
ME (n=7)	61.9%	61.9%	59.5%	61.9%
MT (n=8)	72.9%	64.6%	62.5%	77.1%
OCN (n=2)	41.7%	50.0%	50.0%	50.0%
Gender	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
F (n=7)	64.3%	64.3%	61.9%	66.7%
M (n=26)	69.2%	68.6%	66.7%	70.5%
Ethnicity	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
Asian (n=4)	66.7%	79.2%	75.0%	70.8%
Black (n=2)	58.3%	58.3%	50.0%	58.3%
Hisp (n=7)	54.8%	54.8%	47.6%	59.5%
Unknown (n=2)	75.0%	83.3%	75.0%	83.3%
White (n=18)	74.1%	69.4%	71.3%	73.1%
	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
Institution Wide (n=33)	68.2%	67.7%	65.7%	69.7%

Table A.1, Introductory Level Data (All Dimensions), Average Outcome Percentage

## Mastery Level

Major	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
ET (n=20)	85.0%	100.0%	100.0%	90.0%
GSMA (n=16)	100.0%	100.0%	100.0%	100.0%
IBL (n=36)	100.0%	97.2%	100.0%	97.2%
ME (n=55)	98.2%	100.0%	100.0%	100.0%
MT (n=71)	90.1%	91.5%	94.4%	91.5%
OCN (n=11)	90.9%	90.9%	90.9%	90.9%
Institution Wide (n=209)	94.3%	96.2%	97.6%	95.2%

Table A.2, Mastery Level Data (All Dimensions), **Percentage** of Students Scoring 4 or Better

Major	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
ET (n=20)	17	20	20	18
GSMA (n=16)	16	16	16	16
IBL (n=36)	36	35	36	35
ME (n=55)	54	55	55	55
MT (n=71)	64	65	67	65
OCN (n=11)	10	10	10	10
Institution Wide (n=209)	197	201	204	199

Table A.3, Mastery Level Data (All Dimensions), **Number** of Students Scoring 4 or Better

Major	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
ET (n=20)	77.5%	81.7%	80.8%	78.3%
GSMA (n=16)	86.5%	85.4%	92.7%	93.8%
IBL (n=36)	83.3%	85.7%	84.7%	86.1%
ME (n=55)	78.5%	84.2%	82.4%	83.3%
MT (n=71)	79.6%	80.3%	80.0%	79.6%
OCN (n=11)	90.9%	95.5%	95.5%	93.9%
Gender	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
F (n=42)	84.5%	86.5%	86.9%	86.9%
M (n=165)	80.0%	82.8%	82.5%	82.7%
N (n=2)	75.0%	83.3%	75.0%	66.7%
Ethnicity	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
Amer Indian (n=2)	91.7%	100.0%	91.7%	91.7%
Asian (n=31)	77.4%	82.8%	80.6%	81.7%
Black (n=4)	83.3%	83.3%	83.3%	83.3%
Hispanic (n=53)	79.9%	82.7%	82.1%	83.0%
Two + (n=22)	84.1%	86.5%	87.3%	85.7%
Unknown (n=10)	80.0%	83.3%	80.0%	78.3%
White (n=87)	81.6%	83.1%	84.3%	84.1%
	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
Institution Wide (n=209)	80.9%	83.5%	83.3%	83.4%

Table A.4, Master Level Data (All Dimensions), Average Outcome Percentage

Major	Analysis of Evidence	Application and Synthesis	Comprehension	Context and Assumptions
ET	5.3%	13.1%	10.5%	9.8%
GSMA	7.3%	2.1%	17.7%	14.6%
IBL	22.2%	7.9%	12.5%	13.9%
ME	16.6%	22.3%	22.9%	21.4%
MT	6.7%	15.7%	17.5%	2.5%
OCN	49.2%	45.5%	45.5%	43.9%
Institution Wide	12.7%	15.9%	17.7%	13.7%

Table A.5, Percent Increase from Introductory to Mastery Levels (All Dimensions) by Major

**APPENDIX B: CRITICAL AND CREATIVE THINKING RUBRIC**

These rubrics were designed to assess individual student work such as papers, reports, presentations, and other projects for the following CSU Maritime Institution-Wide SLO B: Critical and Creative Thinking: Comprehend, analyze, and objectively evaluate information and ideas; approach issues in new and different ways, often through synthesizing or applying information.

**CRITICAL AND CREATIVE THINKING RUBRIC**

Comprehend, analyze and objectively evaluate information and ideas.

	<b>Developing-1 1</b>	<b>Developing-2 2</b>	<b>Emerging-3 3</b>	<b>Emerging-4 4</b>	<b>Mastering-5 5</b>	<b>Mastering-6 6</b>
<b>Comprehension</b>	Issue/problem to be considered critically is stated without clarification or description.  Issue/problem to be considered critically is not stated at all and there is no clarification or description.	Issue/problem to be considered critically is stated with minimal clarification or description.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/problem to be considered critically is stated clearly and described comprehensively. All relevant information necessary for full understanding is delivered in a compelling and concise manner.

	<b>Developing-1</b> <b>1</b>	<b>Developing-2</b> <b>2</b>	<b>Emerging-3</b> <b>3</b>	<b>Emerging-4</b> <b>4</b>	<b>Mastering-5</b> <b>5</b>	<b>Mastering-6</b> <b>6</b>
<b>Analysis of Evidence</b>	Information is taken from source(s) without any interpretation/evaluation and there is no conclusion drawn from findings.	Information is taken from source(s) with little to no interpretation/evaluation. Conclusion is attempted, but is not supported by findings.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis. Overly general conclusion.	Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis. conclusion arises specifically from and responds specifically to the inquiry findings.	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. conclusion that is a logical extrapolation from the inquiry findings.	Information is taken from source(s) with enough interpretation/evaluation to develop an insightful and comprehensive analysis or synthesis. conclusion that is a logical extrapolation from the inquiry findings and offers new or creative insights
<b>Influence of context and assumptions</b>	Begins to identify some contexts when presenting a position, showing little awareness of assumptions.  Shows little to no awareness of context or assumptions.	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Thoughtfully analyzes own and others' assumptions and evaluates the relevance of contexts when presenting a position.	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.
<b>Application and Synthesis</b>	Little to no recognition of existing connections among ideas or solutions.	Recognizes existing connections among ideas or solutions.	Connects ideas or solutions in predictable ways.	Synthesizes ideas or solutions in a coherent way.	Synthesizes ideas or solutions into a coherent whole and appropriately applies concepts and ideas.	Transforms ideas or solutions into entirely new forms and appropriately and creatively applies concepts and ideas.