

Area 2 Mathematics and Quantitative Reasoning Assessment Report

Dashboard Link

[Dashboard link to Area 2 Assessment Results](#)

[Dashboard link to Student Survey Area 2 Results](#)

PURPOSE AND BACKGROUND

The overarching purpose of assessment in General Education (GE) is to enhance and improve undergraduate student learning experiences afforded by the GE program at Cal State East Bay. Looking beyond the CSU Chancellor's Office and WASC accreditation requirements which necessitate GE assessment ([EO 1100](#), Section 6.2.5), the true value of GE assessment extends from how we collaboratively make meaning of assessment results to inform improvements in GE.

GE learning outcomes are aligned to the [Institutional Learning Outcomes \(ILOs\)](#), [WASC Core Competencies](#), and [AAC&U's LEAP Essential Learning Outcomes](#), all of which express the knowledge, skills, and values CSUEB graduates are expected to attain. Collectively, CSUEB's GE learning outcomes and ILOs distinguish who we are, what we value, and how we expect students to demonstrate their learning. Thus, the assessment of GE outcomes enables our campus community to gauge how effective we are in helping our students attain these outcomes.

The General Education Long-term Assessment Plan for [2026-2030](#) (previous GE long-term assessment plan: [22-23 CAPR 39](#)) details a consistent, rigorous assessment process.

THE PROCESS

The last time Area 2 (then labeled B4) was assessed was in 2019/2020, just as COVID was shutting down the campus. In July 2025, the Director of General Education met with the chairs of the Statistics and Mathematics department to revise the previous B4 learning outcomes and rubric (both can be found in the Appendix). In Fall 2025 both departments created assignments that would be used for assessing this area. Sections were chosen by the chairs and the Office of General Education had Online Campus collect the assignments at the end of Fall 2025. In Spring 2026, in conjunction with the Chairs of STAT and MATH, assessors were chosen. We ended up with four assessors from STAT and three assessors from MATH. It was decided that each department would assess their own assignments. Assessment took place in Spring 2026 over two weeks.

The MATH assessment consisted of four sections of MATH 115 and four sections of MATH 130. The STAT assessment consisted of four sections of STAT 101.

ASSESSMENT RESULTS (H1)

Interrater Reliability

The results from both MATH and STAT assessors were combined in this instance.

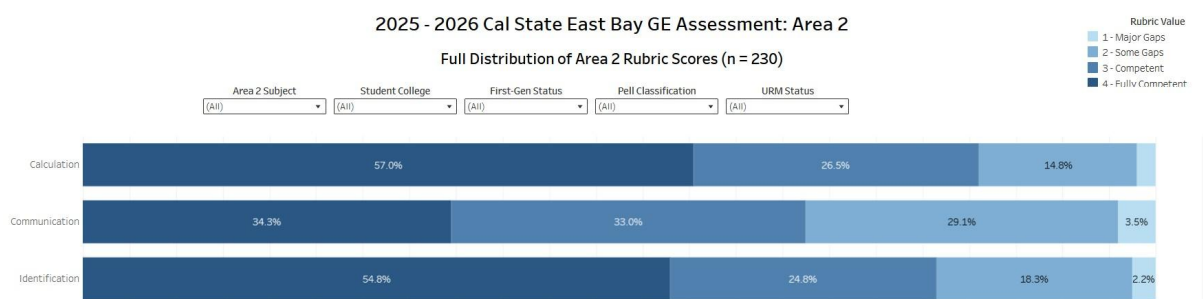
93% of the scores from the seven assessors had a difference of 0 or 1 for Calculation

92% of the scores from the seven assessors had a difference of 0 or 1 for Communication

93% of the scores from the seven assessors had a difference of 0 or 1 for Identification

The interrater reliability scores show that the assessors were all in alignment with each other as they scored.

Combined Overall Scoring for MATH and STAT



As can be seen, 84% of the students received a score of 3 or 4 in Calculation, while 15% received a score of 2 in Calculation. We are looking for an overall score of 75%.

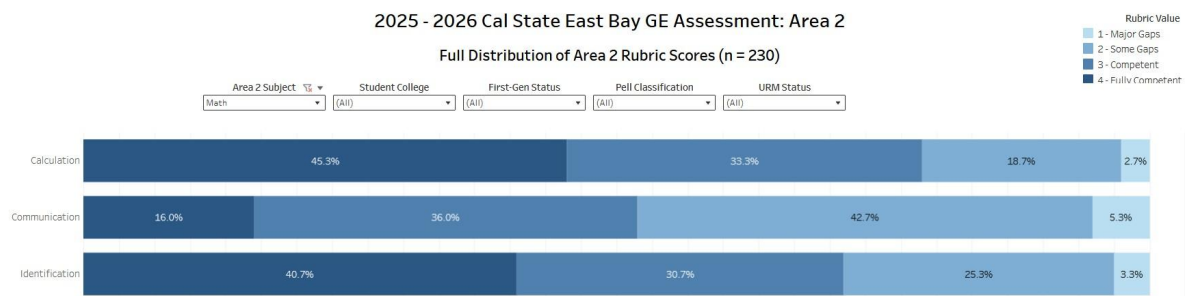
67% of the students received a 3 or a 4 in Communication while 29% received a score of a 2 (some gaps).

80% of the students received a score of 3 or 4 in Identification, while 18% received a 2.

It was discovered that there are differences between the scores received in MATH and those received in STAT, so it was decided to separate out the data for this report.

MATH

Overall Scoring for MATH ONLY

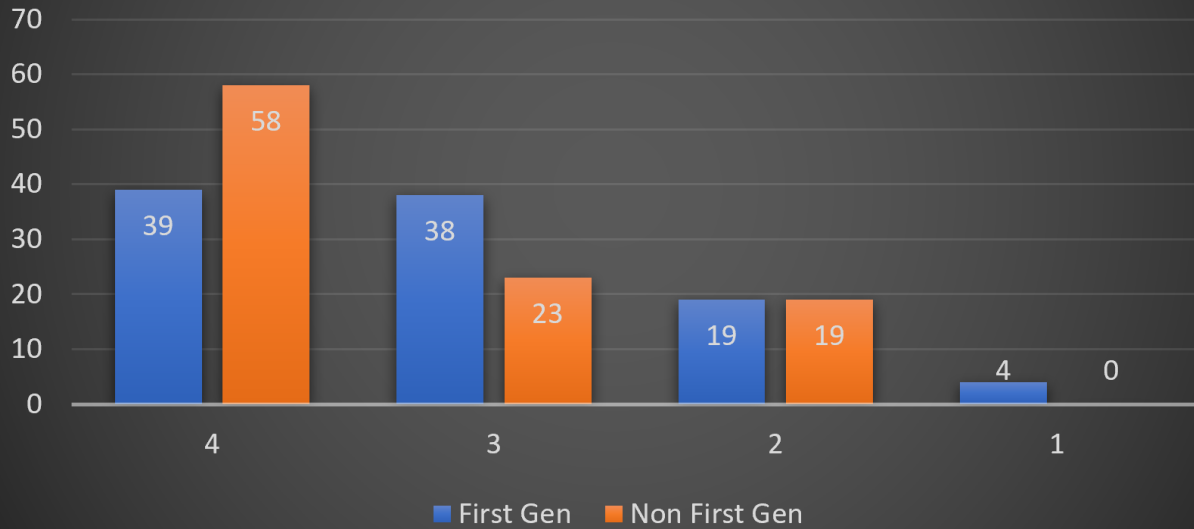


78% of the students received a 3 or 4, while 19% received a 2 in Calculation.
52% of the students received a 3 or 4, while 43% received a 2 in Communication.
71% of the students received a 3 or 4, while 25% received a 2 in Identification.

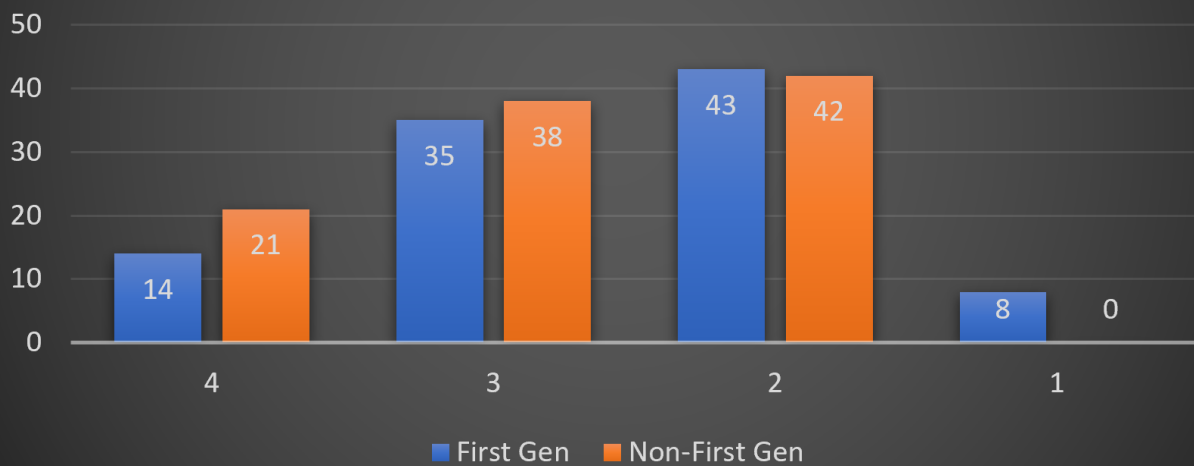
The data can also be broken down by First Gen, Pell, and URM students. The following is taken from the dashboard as percentages.

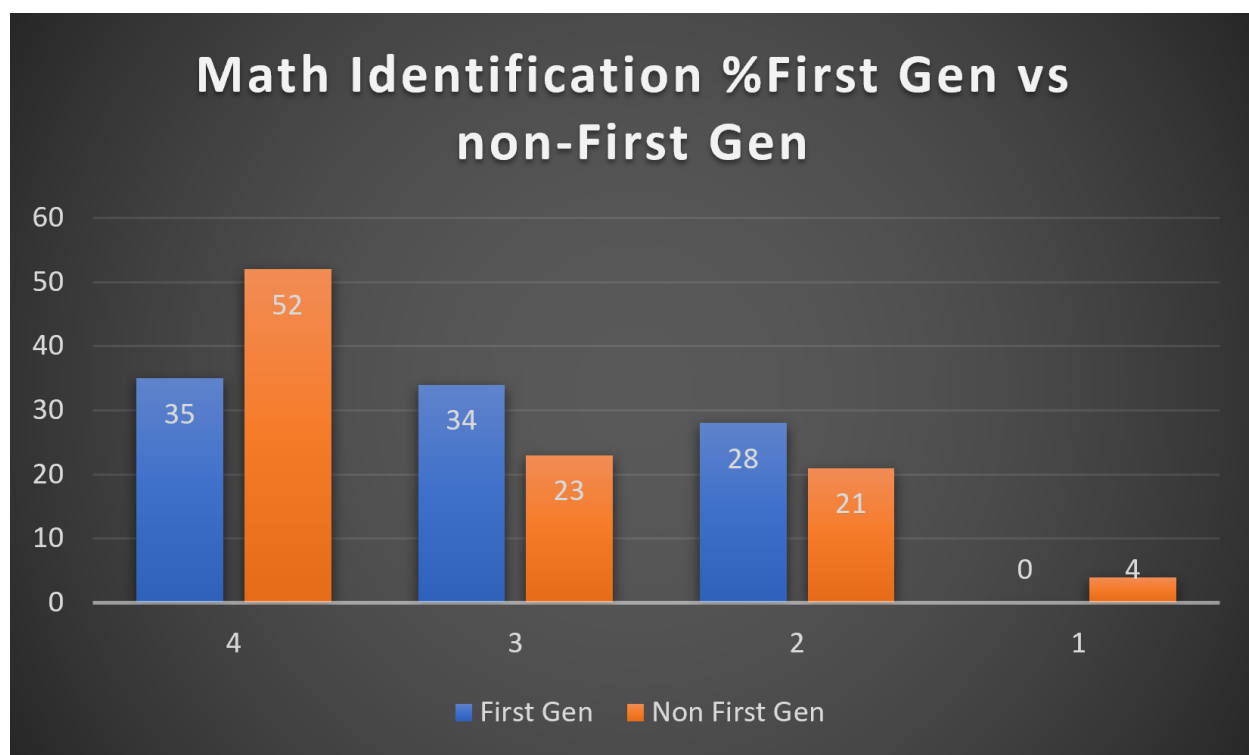
First Gen Data:

Math Calculation %First Gen vs non First Gen



Math Communication %First Gen vs non-First Gen

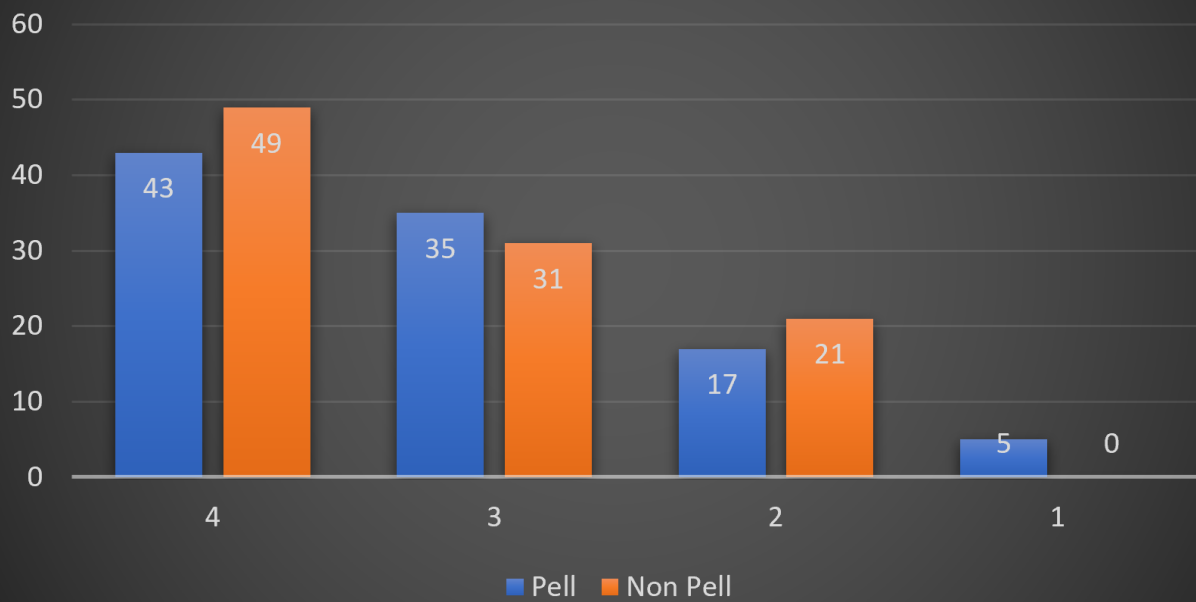




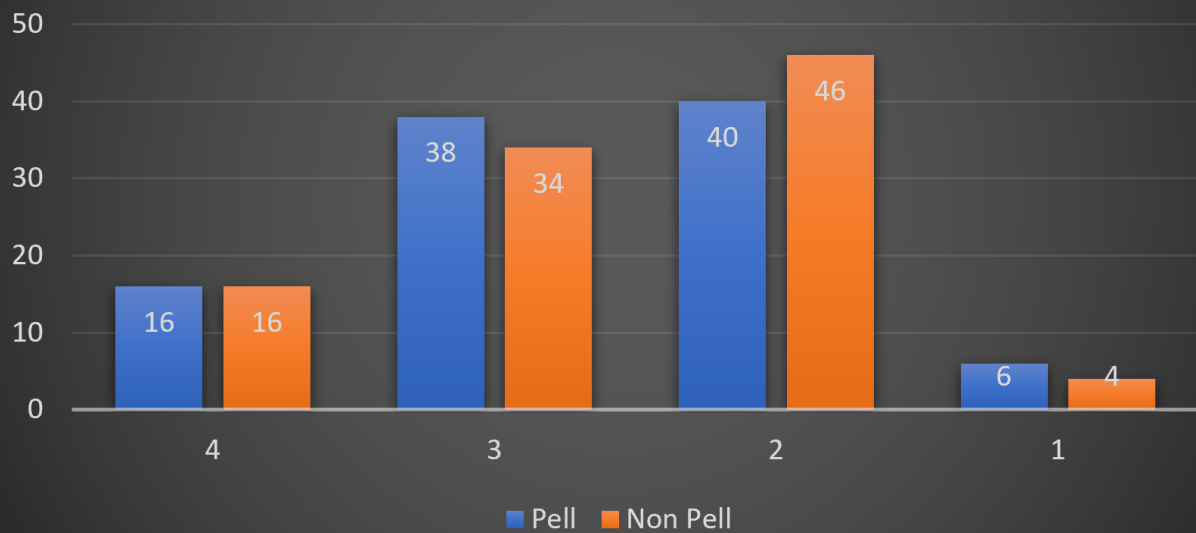
The First Gen students do poorer than their non-First Gen students, in all three areas.

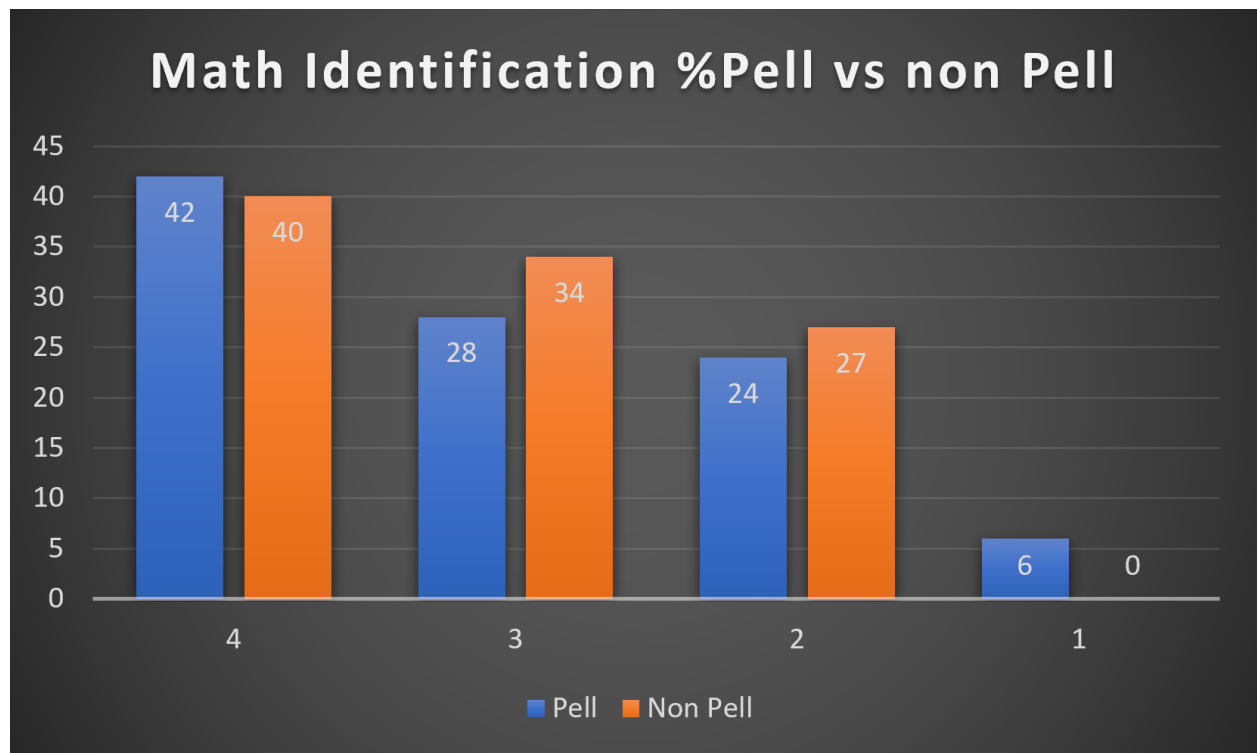
Pell Students

Math Calculation %Pell vs non Pell



Math Communication %Pell vs non Pell

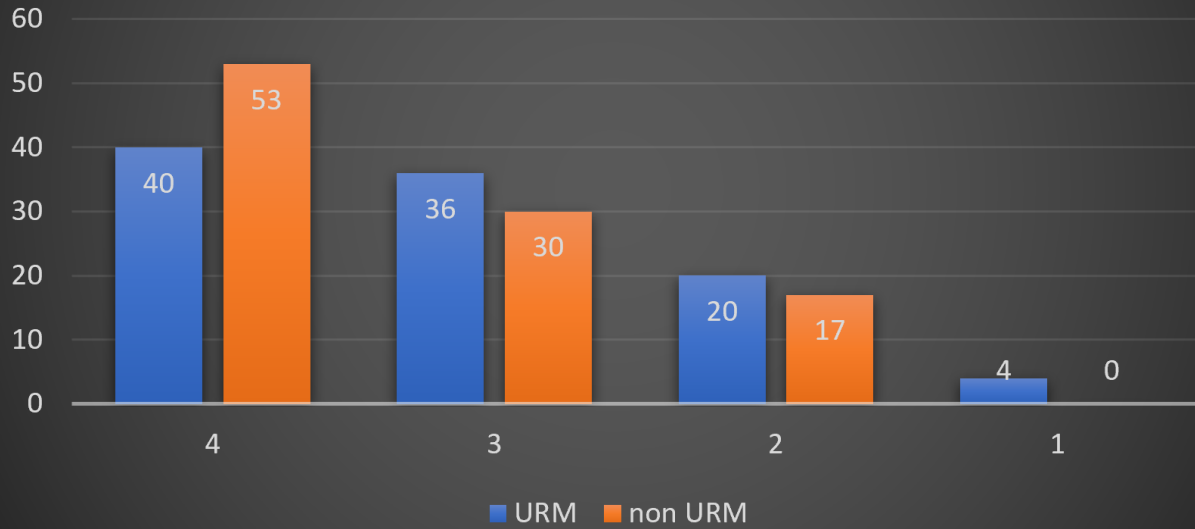




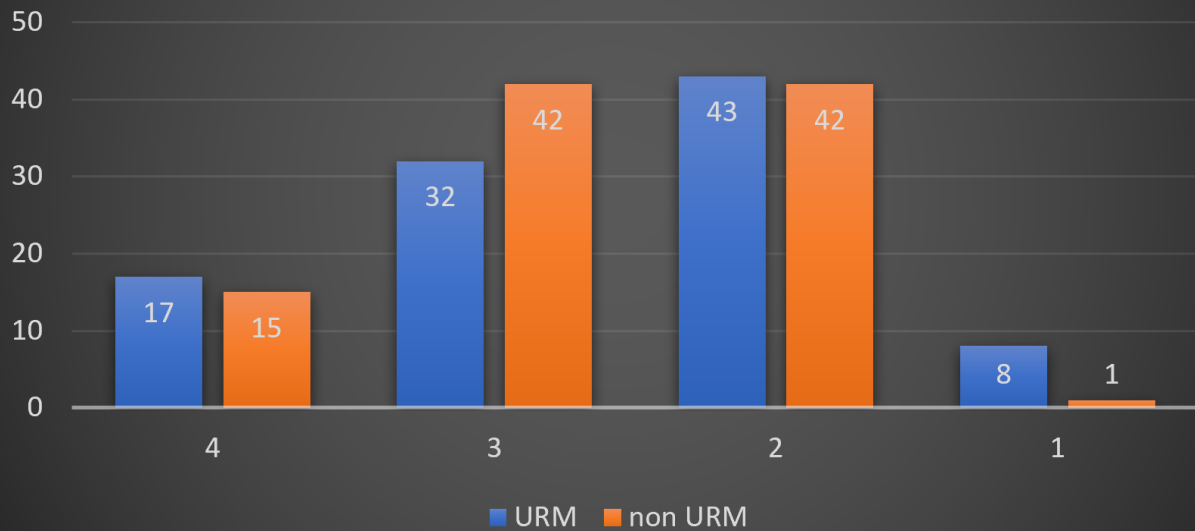
In general, the Pell students scored relatively the same in the three categories

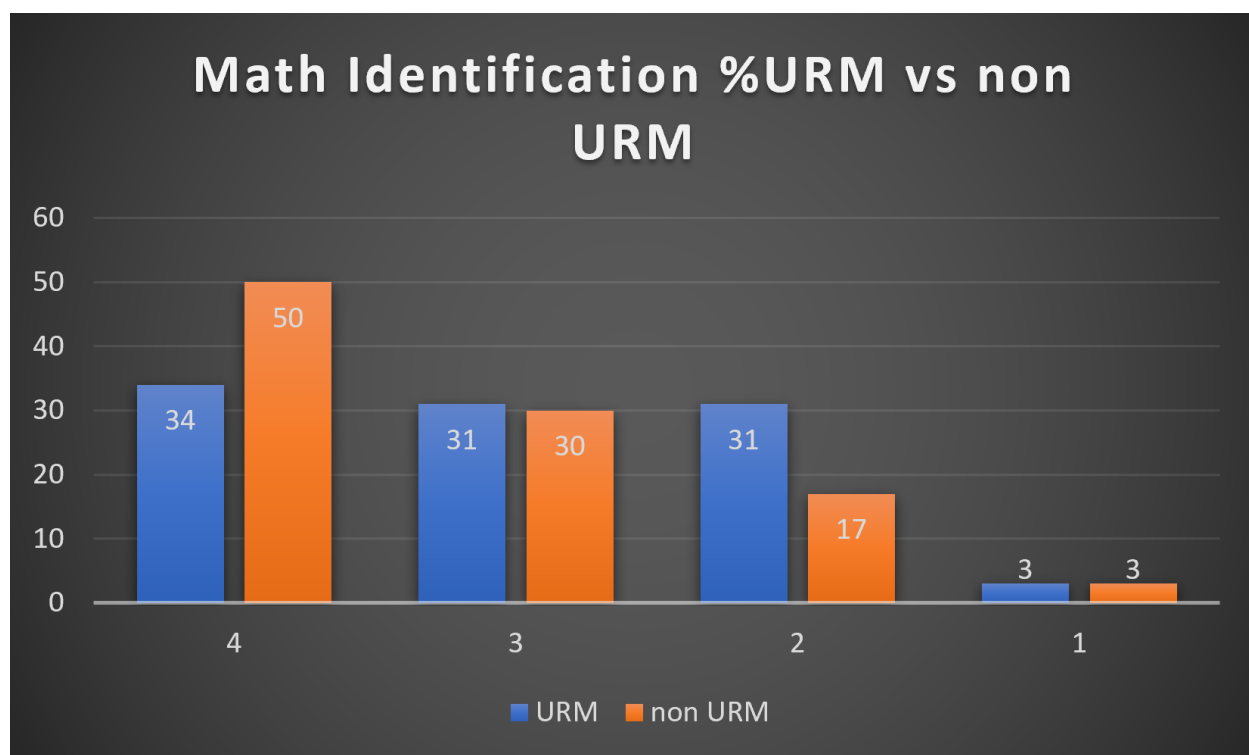
URM

MATH Calculation %URM vs non URM



Math Communication %URM vs non URM

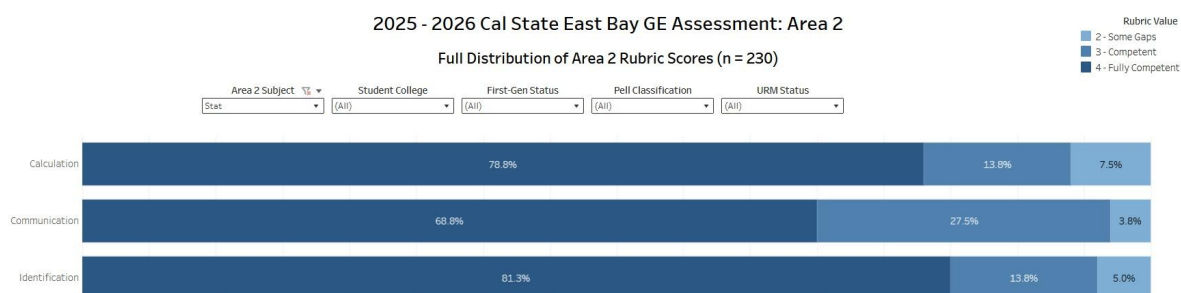




The URM students did much poorer than their non-URM counterparts (except in Communication in the 4 category).

STAT

The overall scores for the STAT students:



93% of the students received a 3 or 4, while 8% received a 2 in Calculation.

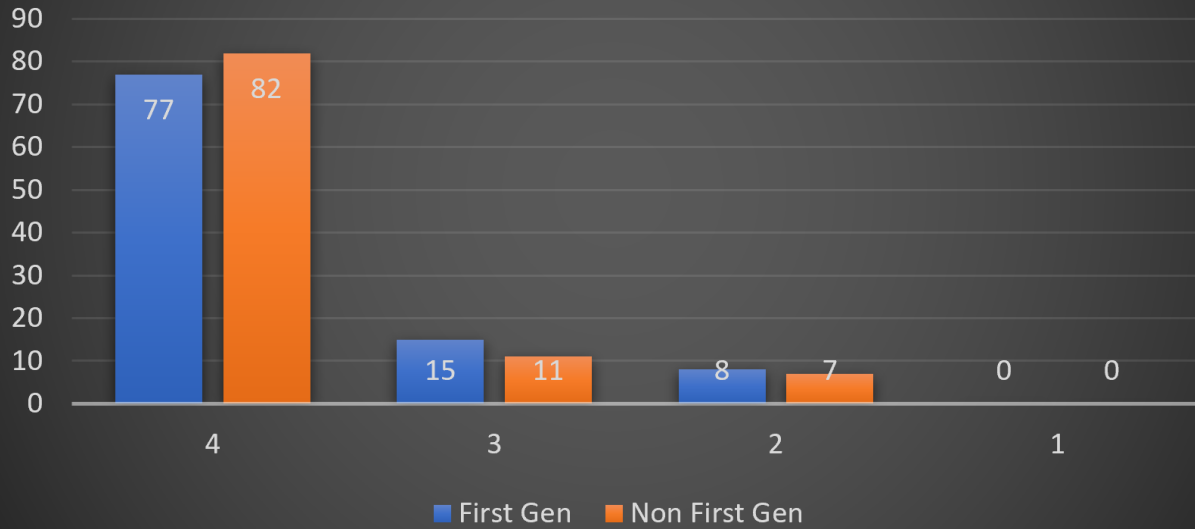
97% of the students received a 3 or 4, while 3% received a 2 in Communication.

95% of the students received a 3 or 4, while 5% received a 2 in Identification.

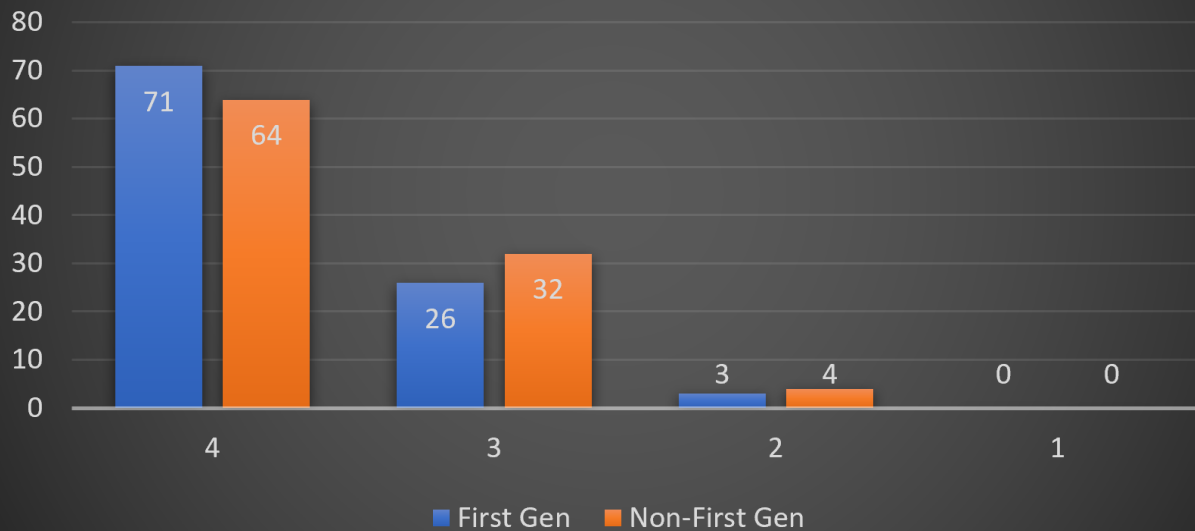
The data can be broken down into our First Gen, Pell, and URM students

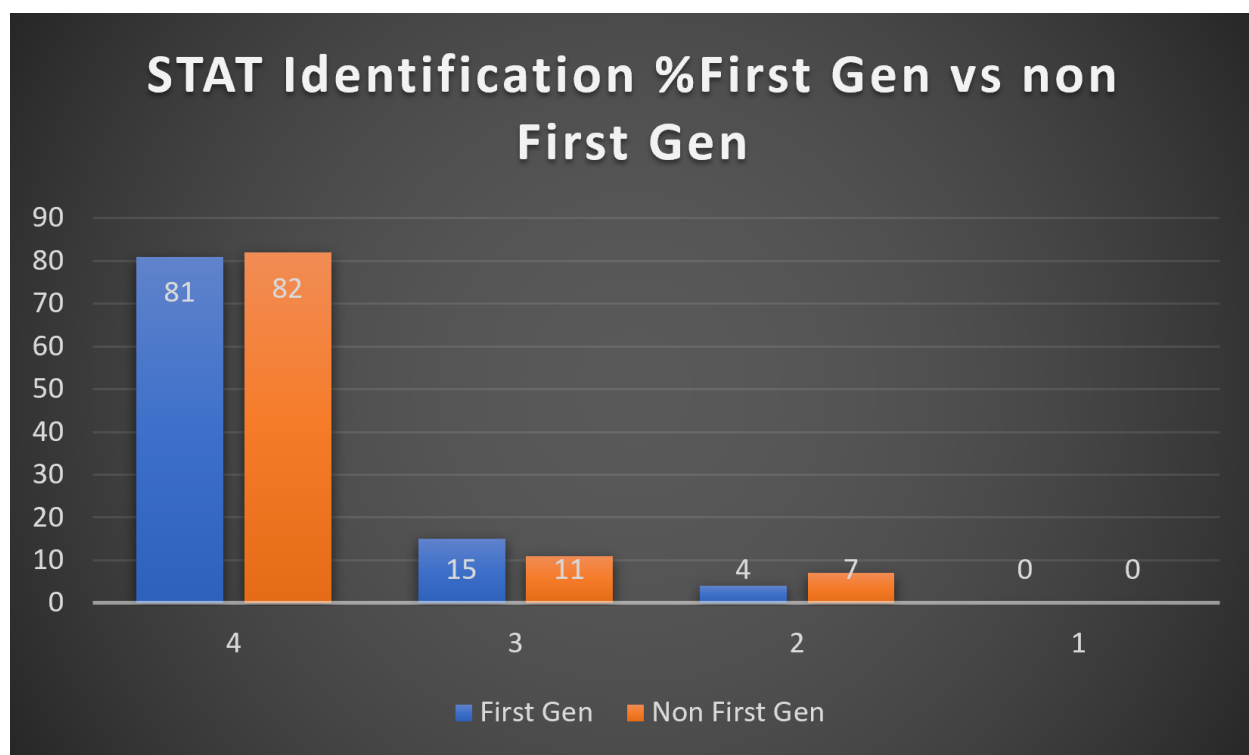
First Gen

STAT Calculation %First Gen vs non First Gen



STAT Communication % First Gen vs non First Gen

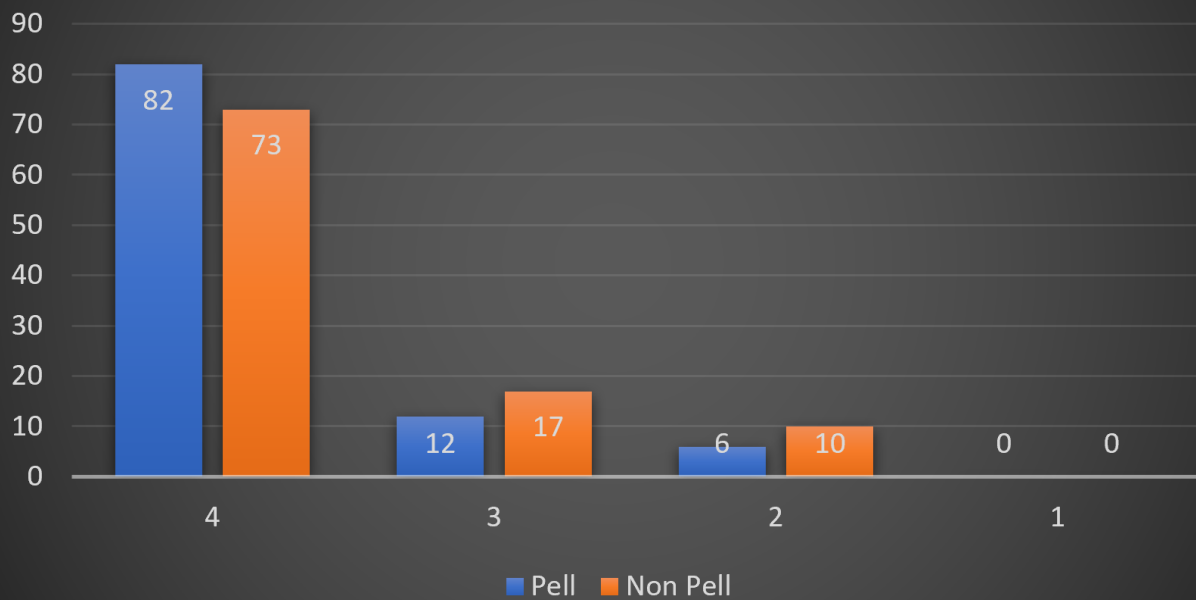




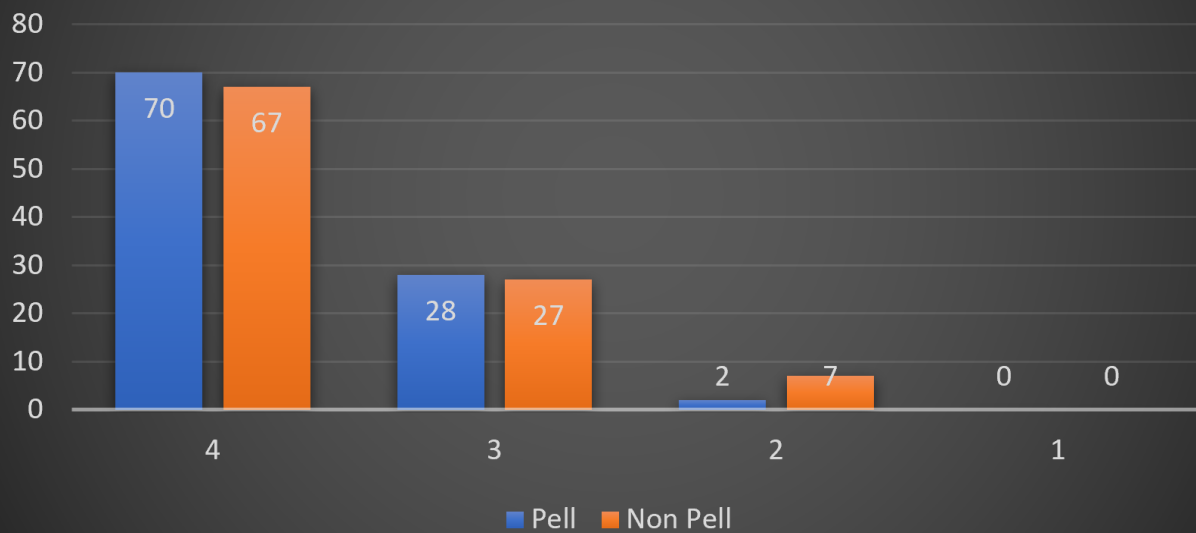
Our First Gen students perform almost the same or better than their non-First Gen counterparts.

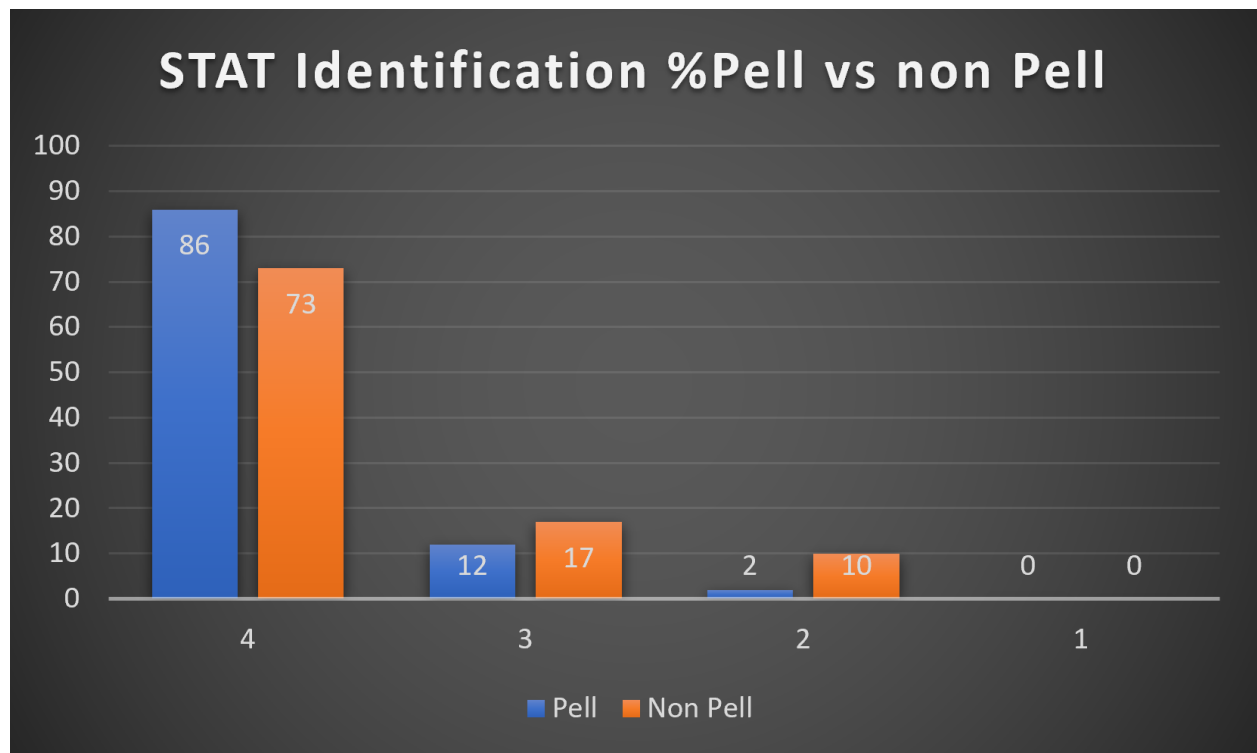
PELL

STAT Calculation %Pell vs non Pell



STAT Communication %Pell vs non Pell

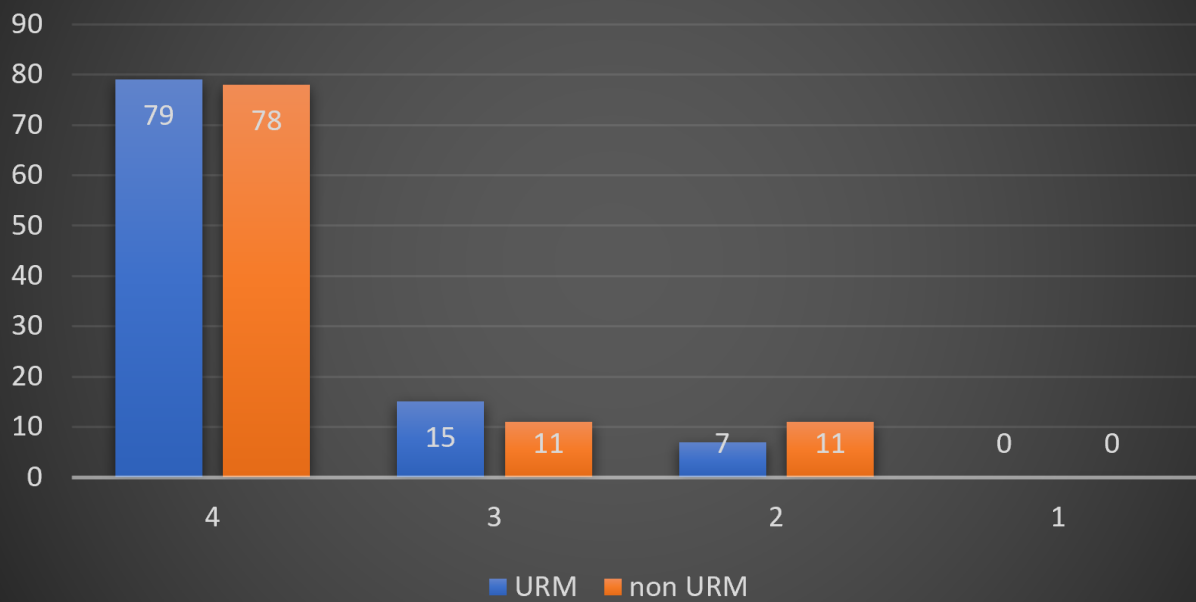




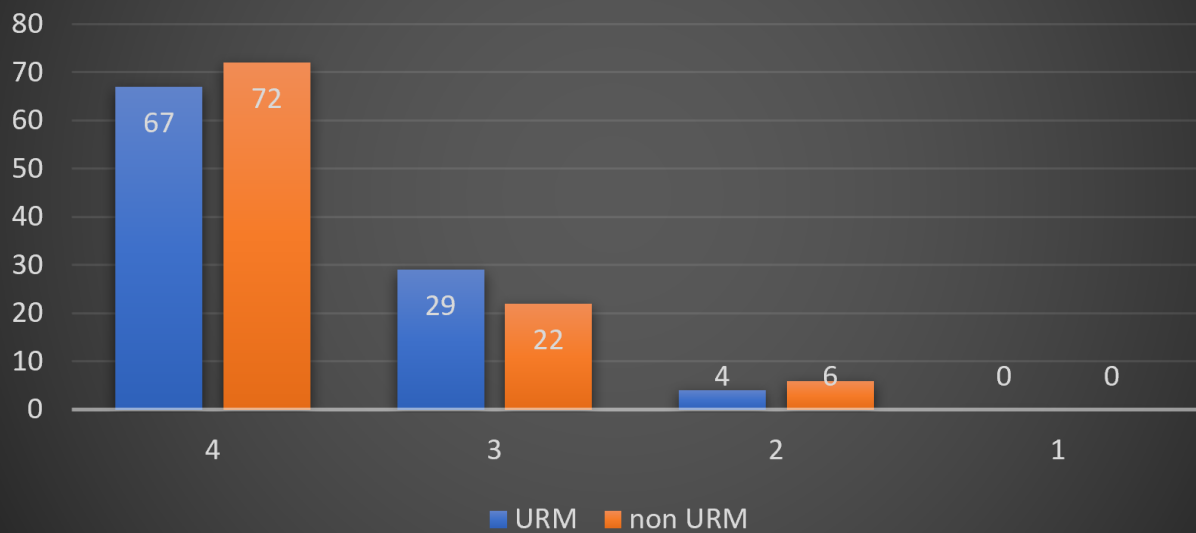
In this case the PELL students outperformed their non-PELL counterparts.

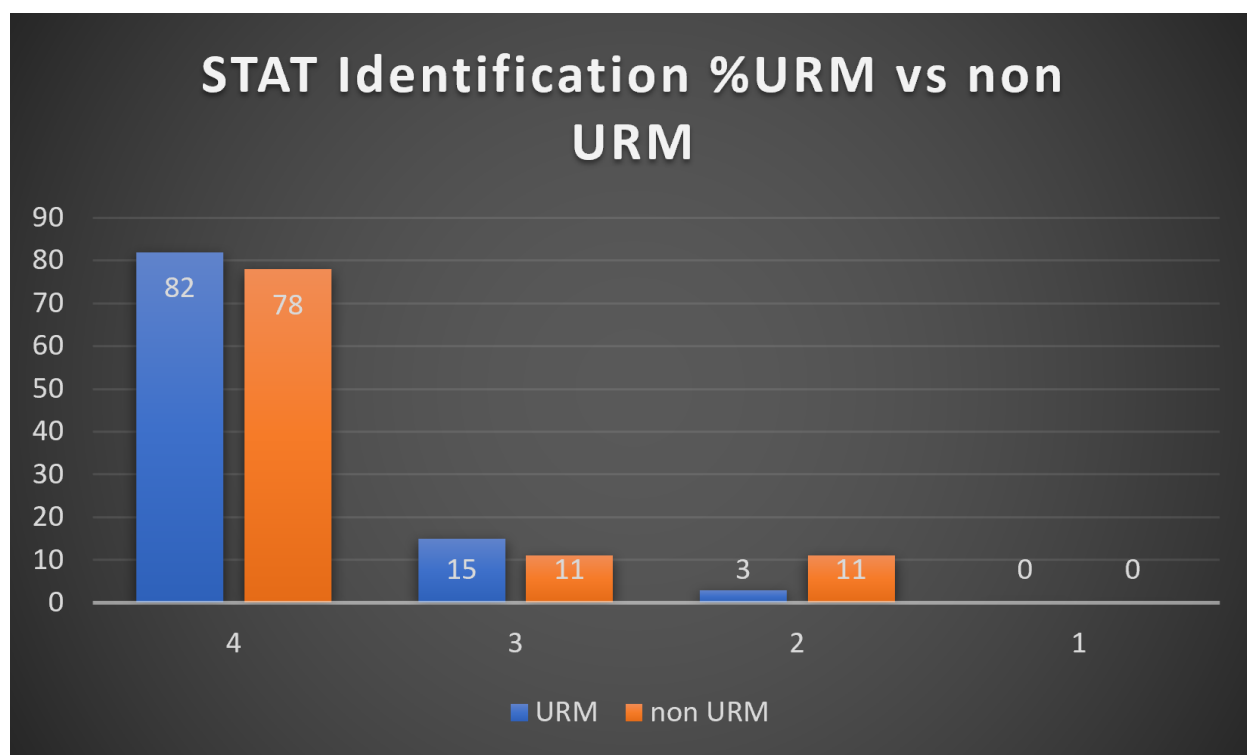
URM

STAT Calculation %URM vs non URM



STAT Communication %URM vs non URM





Here our URM students outperformed their non-URM counterparts in Calculation and Identification while they performed lower than their non-URM counterparts in Communication.

[Link to the Student Survey Results](#)

Select Assessment Comments from faculty assessors

- Some sections seemed to do better overall than other sections. It would be useful to know how much help they were getting from their instructors/LAs or if the topic we chose aligned closer with the coursework in some sections vs others.
- It was helpful to practice with the large group and informative to look at student assignments. The rubric was relatively easy to work with, although there were some borderline cases that we discussed. We were within 1 point on each rubric item, and hearing the reasoning from my peers was helpful for understanding any minor disagreements.
- The rubric was easy to work with. The calibration process and discussion was very helpful and well managed. Conversation about borderline cases with fellow assessors was very valuable.

- Most of the students did very well in the assignments. There were very detailed assignments which broke down to understand the depth of the concepts. I really liked it. One thing was there was some incomplete work but overall students did very well in communicating the results.

Comparisons from the last Area 2 (B4) assessment:

Area 2 (then labeled B4) was last assessed in 2019 and 2020. The report has been published [at the GE website](#). The second assessment (done in 2020) was right during COVID when the MATH and STAT courses were only online. As a result (probably), the scores in 2020 were quite a bit lower. A better comparison would be to look only at the 2019 results. Note that Interpretation in the 2019 Rubric (“*Identifies and organizes relevant information presented in quantitative forms, in order to decide on which approach to take*”) aligns with Identification in the 2025 Rubric (“Identify relevant information in quantitative form to select the approach to take.” The wording for Calculation and Communication in both rubrics is exactly the same.

Math 115 (2019)

MATH 2019 (N = 40)	% Students by Performance Level				%	
	4	3	2	1	Proficient	Inter-rater reliability
Interpretation	73.8	12.5	12.5	1.3	86.3	100.0
Representation	56.3	12.5	21.3	10.0	68.8	95.0
Calculation/Application	23.8	52.5	13.8	10.0	76.3	97.5
Communication	67.5	11.3	16.3	5.0	78.8	97.5

MATH 115E and MATH 130 in 2026:

84% of the students received a score of 3 or 4 in Calculation

67% of the students received a 3 or a 4 in Communication

80% of the students received a score of 3 or 4 in Identification

STAT Comparisons

STAT 2019 STAT 101:

STAT 2019 (N = 32)	% Students by Performance Level	%
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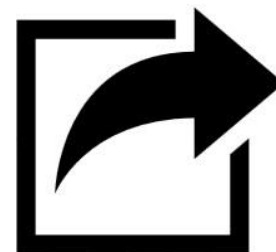
	4	3	2	1	Proficient	Inter-rater reliability
Interpretation	54.7	43.8	1.5	0.0	98.5	96.9
Representation	25.0	48.4	20.3	6.3	73.4	84.4
Calculation/Application	43.8	32.8	12.5	10.9	76.6	90.6
Communication	42.2	29.7	14.1	14.1	71.9	96.9

93% of the students received a 3 or 4 in Calculation.

97% of the students received a 3 or 4 in Communication.

95% of the students received a 3 or 4 in Identification.

CONTINUAL IMPROVEMENT/CLOSING THE LOOP and NEXT ACTION STEPS



The following questions are part of the continuous improvement/closing the loop activity for *each* department teaching Area 2 to fill out and return to the Office of General Education (jennifer.zenovich@csueastbay.edu) by the end of the Fall, 2026. The questions will help guide a specific action plan to improve student success for Area 2, as well as any updates to the rubric/learning outcomes.

- How are these data consistent with your experience as a department/instructor?
- Looking at the overall score for your department: how can you improve the success of your students in those specific areas where they might have scored lower?
- Look at the specific scores for your Pell, First Gen, and URM students. If they did not achieve parity with their counterparts, what concrete steps can you take to improve their success in these courses?
- If your Pell, First Gen, and URM students achieved parity, how do you plan on sharing the techniques you are using in your classroom to help improve the success of these student groups outside of Area 2 courses? This can be college or university-wide.
- As you look through the Student Survey results, what trends do you see and how can student learning be improved, based on these specific results?
- For each department: how do the comparisons between 2019 and 2025 compare to what you were expecting? How can improvements be made before the next assessment?
- Be sure to look at the Student Survey Results—how do the results compare with your experience in the classroom?
- Overall, what steps do you think could be taken to improve student success in general?
- Do you have any advice on updating the learning outcomes and/or rubric for future assessment projects?

Appendix

Revised Rubric and Learning Outcomes

Subject Area 2 Mathematical Concepts and Quantitative Reasoning Revised Rubric and Learning Outcomes

Revised Learning Outcomes:

Upon completion of the GE Area 2 requirement, students will be able to:

1. Reason quantitatively
2. Investigate how practitioners and scholars collect and analyze data, build mathematical models, and/or solve quantitative problems;
3. Apply quantitative reasoning skills in a variety of real-world contexts.

Course Characteristics:

In Area 2 courses, students will not just practice computational skills, but will engage in more complex mathematical work, in accordance with the [CSU GE Area 2 Guidelines and Principles](#). Area 2 courses will have a corresponding support class for students classified as needing support. Exceptions may be made for Area 2 courses that have another Area 2 as a prerequisite, such as Calculus.

Description of Rubric: Proficiency in quantitative reasoning at the Area 2 level is demonstrated by the use of interpretation, representation, calculation, and communication of quantitative information at the college level. Area 2 courses build upon, and add depth and sophistication to, the quantitative skills that are developed by the required high school curriculum—skills that are evaluated through CSU’s Multiple Measures Protocol (see p. 3 of [EO 1110 FAQs](#)) and are used to determine whether incoming freshmen across the CSU will require additional support in their Area 2 courses.

Framing Language: This rubric is used to assess established signature assignments, which are aligned to the rubric. The rubric dimensions described below are sequential in nature—a student must first interpret, then execute/calculate. Each dimension should be evaluated independently, because a student may, for example, make an error in the interpretation and/or development steps, but then correctly execute/calculate their chosen approach. Finally, communication should be demonstrated throughout the solution process, and therefore should

be the last dimension assessed.

Development: Faculty Chairs from Math and Statistics and the Office of GE worked on revising the learning outcomes and rubric in Summer 2025. The original rubric was developed by faculty in the Departments of Mathematics and Statistics & Biostatistics on May 30, 2019.

	PERFORMANCE DESCRIPTORS BY LEVEL			
DIMENSION	4	3	2	1
Identification <i>Identify relevant information in quantitative form to select the approach to take</i>	Clearly identifies relevant quantitative information, resulting in selecting a valid approach.	Adequately identifies relevant quantitative information, resulting in a valid approach.	Has major errors or gaps in the identification of relevant quantitative information, resulting in a flawed approach.	Does not identify relevant quantitative information, resulting in an incorrect or inappropriate approach.
Calculation <i>Apply and execute their selected method to solve the quantitative problem</i>	Accurately applies and executes their selected method to solve the quantitative problem.	Makes some minor errors in the application and execution of their selected method to solve a quantitative problem.	Makes major errors in the application and execution of their selected method to solve a quantitative problem.	Fails to apply and execute their selected method to solve a quantitative problem.
Communication <i>Quantitative information used to explain, justify, and/or summarize an argument</i>	Effectively use quantitative information to explain, justify, and/or summarize an argument.	Adequately uses quantitative information to acceptably explain, justify, and/or summarize an argument.	Inadequately or inconsistently uses quantitative information to explain, justify, and/or summarize an argument.	Fails to use quantitative information to explain, justify, and/or summarize an argument.

