CALIFORNIA STATE UNIVERSITY, CHICO
ANNUAL PROGRAM ASSESSMENT REPORT

March 29, 2021

I. Assessment of Student Learning Outcomes

1. Program Name and Contact Information of Program Assessment Coordinator:

B.S. in Computer Information Systems
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2. Student Learning Outcomes

https://www.csuchico.edu/csci/programs/bs-cis.shtml (needs to be updated!)
https://www.csuchico.edu/ecc/program-portfolio/bs-cinf/index.shtml (needs to be updated!)

See http://bit.ly/csci-cins-assessment-plan for the latest information …

3. Course Alignment Matrix:

https://www.csuchico.edu/ecc/program-portfolio/bs-cinf/bs-cins-matrix.pdf (needs to be updated!)

See http://bit.ly/csci-cins-assessment-plan for the latest information …

4. What is your current Assessment Plan

We follow a three-semester assessment cycle where half our student learning outcomes are assessed in the first semester, the other half on the second semester, and the third semester is used to focus on evaluation and to implement any changes. We follow an assess-evaluate-change cycle so we can quickly measure the impact of any potential assessment-driven changes we make to our curriculum.

For AY 2019-2020, we gathered embedded assessment data only in Spring 2020 per our Assessment Plan.

See http://bit.ly/csci-cins-assessment-plan for additional information.

5. Learning Outcome(s) Assessed in AY 2019-2020:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

6. Assessment Methodology Used:

We triangulate results from multiple direct and indirect assessment methods (identified below) to get meaningful measures of how well our students attain our student outcomes. We use a department-approved threshold of 70% to determine attainment for all outcomes. Sample sizes are always noted and whenever possible we keep track of the number of students from the sample who achieved the 70% benchmark or better.

Embedded Assessment (Spring 2020 collection only)

- The program has an updated course alignment matrix that indicates which courses we gather embedded assessment data from. Our student outcomes are further divided into *performance indicators* to facilitate any potential actions for curricular changes. These performance indicators are associated with a particular artifact or deliverable in a course. The ACM CS2013 learning outcomes were used to select potential performance indicators for the student outcome(s).
- A Google Form (see http://bit.ly/embed-2020s) was used to gather embedded assessment data from faculty. Data gathered includes the raw scores from participating students and the maximum possible score for the deliverable/activity so the scores can be normalized. Input to the forms were collected and are used as a data source for a dashboard (see http://bit.ly/csci-cins-assessment-data) designed to facilitate faculty conversations on potential curricular changes based on this data.

Institute for Certification of Computing Professionals (ICCP) IS2010 Curriculum Standard Exit Exam

- 8 CINS majors (Fall 2020) took the ICCP IS2010 Curriculum Standard Exit Exam in AY 2019-2020.
- The ICCP IS2010 Exit Exam results provide a mapping of its 516 questions to each of the former ABET CAC student outcomes a through j. We used an ABET CAC recommended mapping from student outcomes a through k to the current ABET CAC student outcomes 1 through 6 to group the results by our current student outcomes. Our results summarize our students' (Local) average compared to the National average for the appropriate groups of questions.

Student Outcome	Number of ICCP Exit Exam Questions Mapped to Outcome
1: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	36
2: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	133
3: Communicate effectively in a variety of professional contexts.	5
4: Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	21
5: Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	12
6: Support the delivery, use, and management of information systems within an information systems environment.	51

ECC Graduating Senior Survey

- 17 CINS majors took our ECC Graduating Senior Survey in AY 2019-2020 (13 in Fall and 4 in Spring).
- This survey's section on the self-reporting of students' perceptions of their level of attainment of student outcomes is still based on the prior (pre-2019) list of ABET CAC/EAC student outcomes. Since our process has transitioned to the new ABET CAC student outcomes, a mapping from the prior outcomes to the current outcomes was used to interpret this year's survey data. See http://bit.ly/ABET-CAC-student-outcomes
- The survey questions that pertain to this report are the major-specific questions regarding student outcomes. These are identified as Question IDs 47 a through k in the survey instrument.

7. Assessment Results:

Our annual assessment results are summarized here: http://bit.ly/csci-cins-assessment-data

According to CRA Job #654, in AY 2019-20 we had 116 CINS majors.

Table 1: B.S. in Computer Information Systems assessment data sources for 2019-2020.

Student Learning Outcome	Sample size	Measure	Students Meeting Benchmark
1: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.	*n*=12 from CSCI 311	Project 1: implement Quick sort, Insertion sort and Selection sort algorithms for (1) sorting suffixes of a given string using the three algorithms, and (2) finding the k-th smallest suffix of a given string.	91.7% (11/12)
	n=3 from CSCI 580	Given a particular application domain, determine which one of Simple K-Means or Hierarchical Clustering is a better approach to cluster a given dataset to discover unknowns about the data.	100.0% (3/3)
	n=1 from CINS 490	The capstone project involved evaluating a problem and creating an algorithmic solution to satisfy its requirements.	100.0% (1/1)
	n=11 from CINS 490	Semester long individual capstone software project.	**45.5%** (5/11)
	n=8	Questions from the ICCP Information Systems 2010 Curriculum Standard Exit Exam that map to this outcome, taking the minimum of local average / national average and 1.0	100.0% Local vs national average
	n=17	ECC Graduating Senior Survey, 47a (Apply my knowledge of business, computing, and mathematics at a level appropriate to the IS discipline) indicating Very Prepared or Prepared	93.8% (15/16)
	n=17	ECC Graduating Senior Survey, 47b (Analyze business problems and identify and define the computing requirements appropriate to their solution) indicating Very Prepared or Prepared	88.2% (15/17)
2: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	*n*=8	Questions from the ICCP Information Systems 2010 Curriculum Standard Exit Exam that map to this outcome, taking the minimum of local average / national average and 1.0	100.0% Local vs national average
	n=17	ECC Graduating Senior Survey, 47c (Design, implement, and evaluate computer-based business systems, processes, or components to meet business needs) indicating Very Prepared or Prepared	82.4% (14/17)
	n=17	ECC Graduating Senior Survey, 47i (Use the current techniques, skills, and tools necessary for an IS professional) indicating Very Prepared or Prepared	82.4% (14/17)
3: Communicate effectively in a variety of professional contexts.	*n*=13 from CSCI 301	Group assignment simulating the charge of advising the U.S. government as to what should be done and who should be in charge of our Nation's Cyber Security and presenting their findings and recommendations.	100.0% (13/13)

Student Learning Outcome	Sample size	Measure	Students Meeting Benchmark
	n=1 from CSCI 490	Presentation of the capstone project via narrated a video that demonstrated their software in action.	100.0% (1/1)
	n=11 from CSCI 490	Final project presentation. It included: written slides of the project and an oral discussion and a demonstration of the software.	**45.5%** (5/11)
	n=8	Questions from the ICCP Information Systems 2010 Curriculum Standard Exit Exam that map to this outcome, taking the minimum of local average / national average and 1.0	83.6% Local vs national average
	n=17	ECC Graduating Senior Survey, 47f (Communicate effectively, both orally and in writing, with a range of audiences) indicating Very Prepared or Prepared	**64.7%** (11/17)
4: Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	*n*=3 from CSCI 580	Personal Review of "Healed through A.I. - The Age of A.I.," S1 E2 (Dec 2019).	100.0% (3/3)
	n=8	Questions from the ICCP Information Systems 2010 Curriculum Standard Exit Exam that map to this outcome, taking the minimum of local average / national average and 1.0	100.0% Local vs national average
	n=17	ECC Graduating Senior Survey, 47e (Understand the professional, ethical, legal, security and social issues and responsibilities that go with the IS profession) indicating Very Prepared or Prepared	**64.7%** (11/17)
	n=17	ECC Graduating Senior Survey, 47g (Analyze the local and global impact of computing on individuals, organizations, and society) indicating Very Prepared or Prepared	82.4% (14/17)
	n=17	ECC Graduating Senior Survey, 47h (Recognize the need for, and an ability to, engage in continuing professional development) indicating Very Prepared or Prepared	82.4% (14/17)
5: Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.	*n*=4 from CINS 370	Project Contribution level - as observed during labs, indicated in peer evaluations, and explicit by lack of self-evaluation submissions.	75.0% (3/4)
	n=8	Questions from the ICCP Information Systems 2010 Curriculum Standard Exit Exam that map to this outcome, taking the minimum of local average / national average and 1.0	100.0% Local vs national average
	n=17	ECC Graduating Senior Survey, 47d (Function effectively on teams to accomplish a common goal) indicating Very Prepared or Prepared	82.4% (14/17)
6: Support the delivery, use, and management of information systems within an information systems environment. [IS]	*n*=8	Questions from the ICCP Information Systems 2010 Curriculum Standard Exit Exam that map to this outcome, taking the minimum of local average / national average and 1.0	100.0% Local vs national average
	n=17	ECC Graduating Senior Survey, 47j (Understand the processes that support the delivery and management of information systems within a specific application environment) indicating Very Prepared or Prepared	82.4% (14/17)

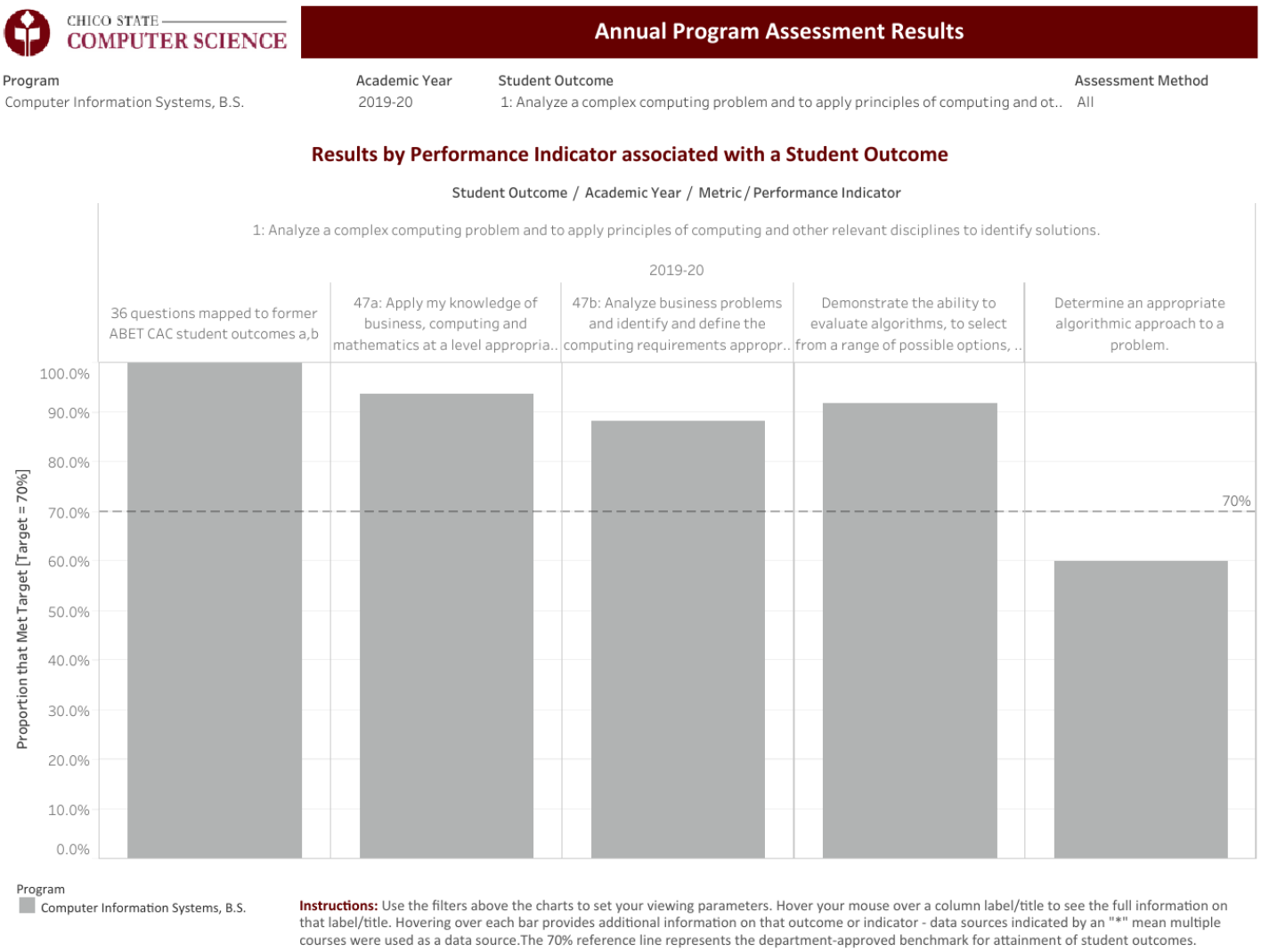

Figure 1: Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

There appears to be a potential issue with student outcome 1 based on direct (observed by faculty) assessment data shown in Table 1. Note that the problem appears less severe in Figure 1, compared to Table 1, due to CSCI 580 and the other CINS 490 being direct assessment sources using the same performance indicator to get 9/16=60%.

This appears to be a function of class size. The faculty need to re-evaluate how it assigns CSCI/CINS 490 senior capstone projects.

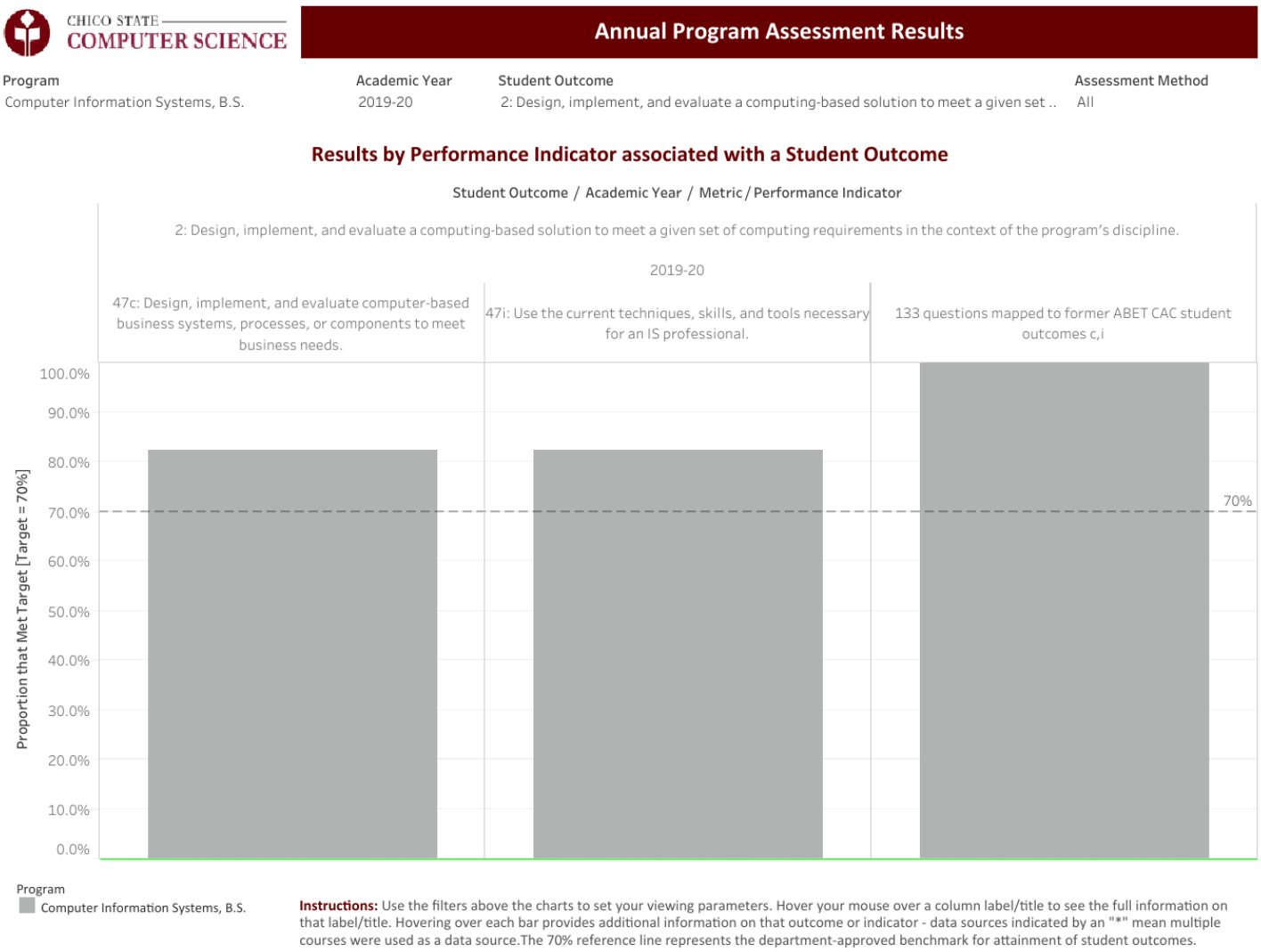

Figure 2: Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

There does not appear to be any potential issues to address with student outcome 2.

Note: There are some interesting results from the *ICCP IS2010 Curriculum Standard Exit Exam* (in particular, those that relate to ABET Outcome 2, drilling down to the former ABET Outcomes i1 through i7) that our CINS Curriculum Committee will be reviewing.

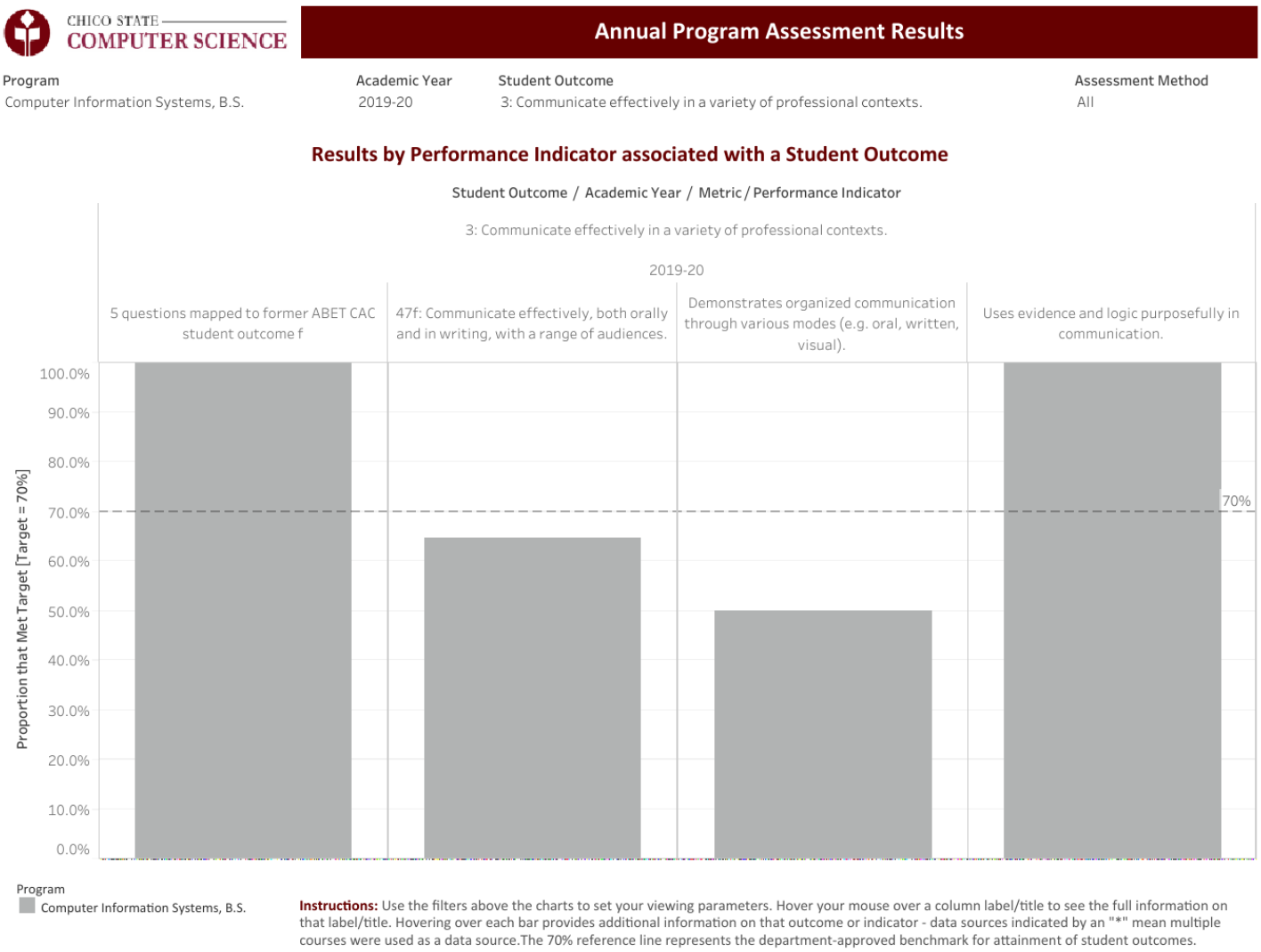

Figure 3: Communicate effectively in a variety of professional contexts.

There appears to be a potential issue with student outcome 3 based on both direct (observed by faculty) and indirect (self-reporting by students) assessment data shown in Table 1 and Figure 3 above. Note that the second from the right bar in Figure 3 above does not exactly match Table 1 due to the other CINS 490 section being another direct assessment source using the same performance indicator.

The faculty will review the *ECC Graduating Senior Survey* Supplemental/Major-specific question 47f as to whether it should be broken up into two separate questions: one to address oral, and the other written, communication.

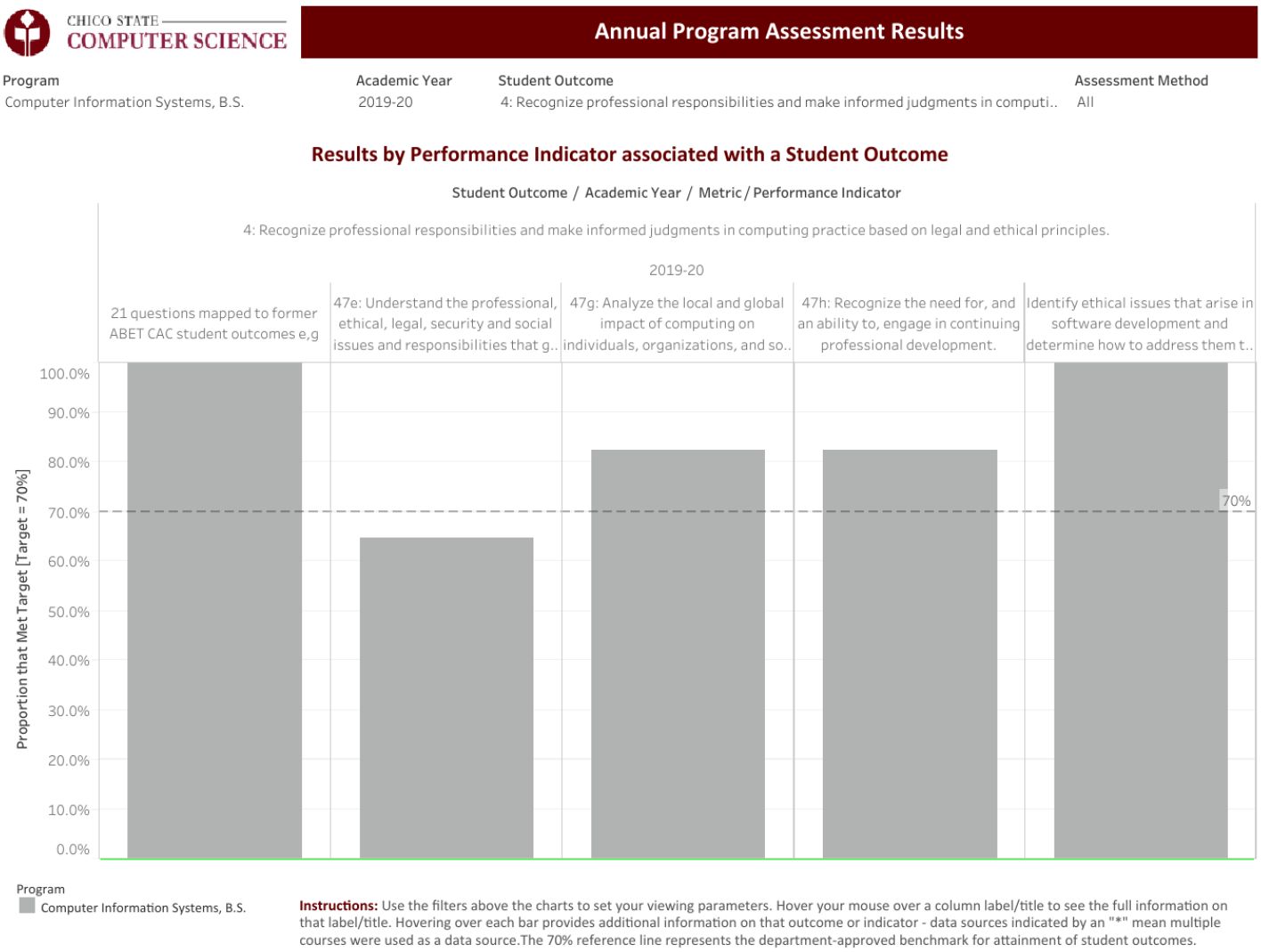

Figure 4: Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

There appear to be some potential issues with student outcome 4 based on an indirect assessment data source: our *ECC Graduating Senior Survey* supplemental question 47e. This is an indication of our students' perception on how well they feel they understand professional, ethical, legal, security, and social needs and responsibilities that go with the IS profession. Note the difference between this result (the second from the left bar) and the direct assessment result (rightmost bar) in Figure 4 above.

The faculty will carefully consider and review where and how our CINS majors are getting exposure/training on professional and ethical matters.

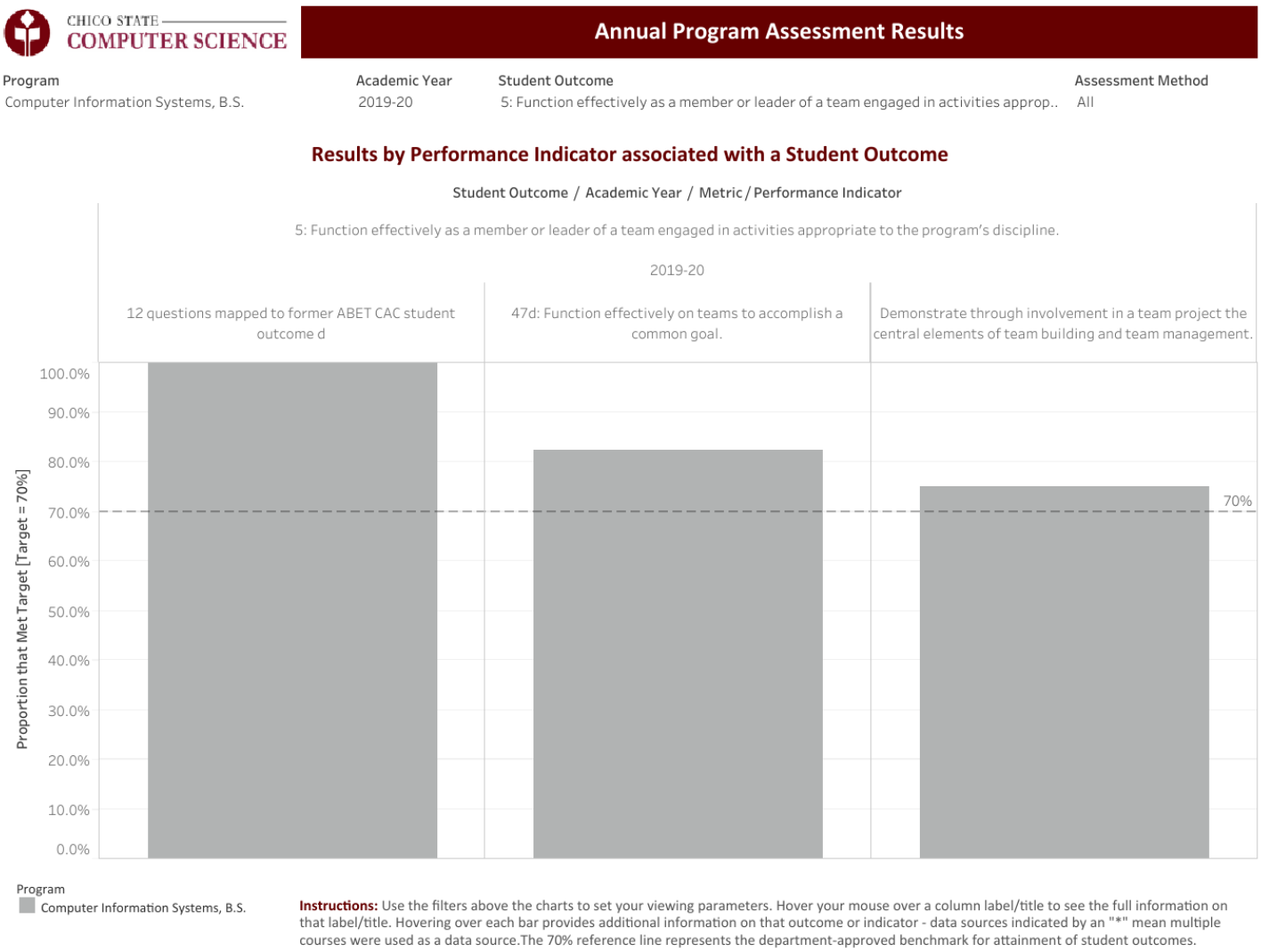

Figure 5: Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

There does not appear to be any potential issues to address with student outcome 5.

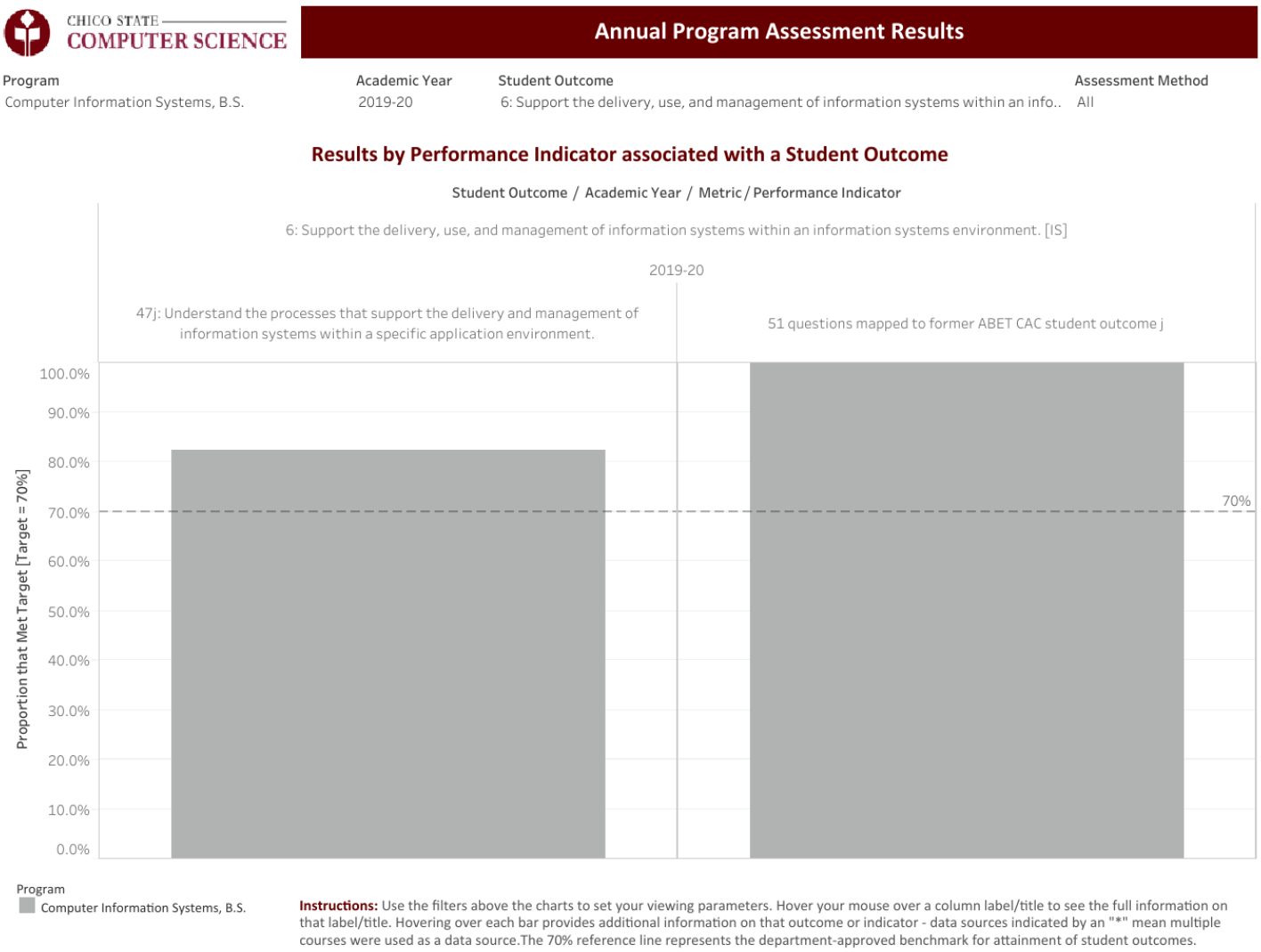

Figure 6: Support the delivery, use, and management of information systems within an information systems environment.

There does not appear to be any potential issues to address with student outcome 6.

8. Analysis / Interpretation /Dissemination of Results

Our annual assessment results (see http://bit.ly/csci-cins-assessment-data) are available online and are shared with the faculty after the Assessment Committee has reviewed it and confirmed its accuracy. Draft annual program assessment reports (*i.e.* APASU and APAR) are shared with faculty to give them ample time to digest the information before the results are discussed at a department meeting. The faculty discuss and agree to any curricular adjustments that should be considered based on our annual program assessment results. The faculty vote to accept the annual program assessment reports before they are submitted.

All department assessment data and reports are stored in a shared folder in Box for department faculty access. The College of ECC maintains all prior annual program assessment reports submitted to campus in the ECC-Shared folder called Program Improvement Reports in Box.

9. Closing the Loop: Planned Program Improvement Actions

a) Planned curriculum changes for improved learning outcomes.

The faculty will carefully consider and review where and how our CINS majors are getting exposure and/or training on professional and ethical matters.

b) Planned Revision of Measures or Metrics (if applicable)

Our CINS Curriculum Committee will review the data and results from the *ICCP IS2010 Curriculum Standard Exit Exam* and share those with the faculty. In particular, a careful analysis of the knowledge area, learning unit, and descriptions of the questions scored will be analyzed to determine which subset of questions align with our curriculum for use in program assessment.

The faculty will review the *ECC Graduating Senior Survey* Supplemental/Major-specific question 47f as to whether it should be broken up into two separate questions: one to address oral, and the other written, communication.

c) Planned Revisions to Program Objectives or Learning Outcomes (if applicable)

None.

d) Changes to Assessment Schedule (if applicable)

The faculty is considering a move from a 3-semester cycle to a 2-year cycle, effective Fall 2021, so it can invest more time in the evaluation process.

10. Information for Next Year

We are evaluating assessment results and implementing any potential curricular changes in the Fall 2021 semester. Our assessment data gathering schedule will resume in Fall 2021.

See http://bit.ly/csci-cins-assessment-plan for additional information.

II. Appendices (please include any of the following that are applicable to your program)

A. Assessment Data Summaries (Details that elaborate on item 6, above.)

- The 2019-2020 ABET Computing Accreditation Commission (CAC) criteria is available online at https://www.abet.org/accreditation/accreditation-criteria/criteria-for-accrediting-computing-programs-2019-2020/

B. Measurement Instruments (Rubrics, Surveys, etc.)

- A copy of the Spring 2020 version of the *ECC Graduating Senior Survey* is available from the ECC-Shared folder called Graduating Senior Survey in Box.
- Our online embedded assessment data submission form for Spring 2020 is available here: http://bit.ly/embed-2020s